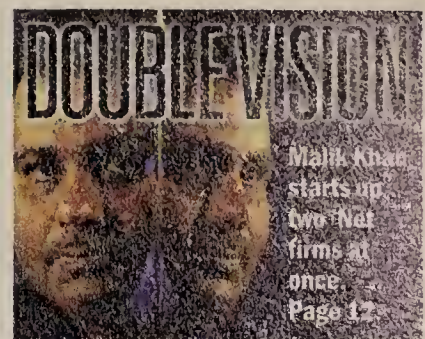


NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



INTRANET

What's doin' with Domino?

Lotus was late to the intranet game, but Domino is coming on strong

ALSO INSIDE

- Barksdale on lessons learned
- Sandia National Labs powers up Web-based workflow

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Lotus and Intranet you can't live without
Review: *Domino's* Cage 8

Lucent stakes claim to enterprise nets

By David Rohde
Murray Hill, N.J.

Lucent Technologies, Inc. last week made its long-anticipated entry into the enterprise data switching market with a family of homegrown ATM products.

The flagship offering is the Lucent MX 1000, an ATM multiservice device that can alternatively serve as an enterprise or carrier edge switch. The 10G bit/sec nonblocking device has 14 slots, each providing 622M bit/sec of bandwidth.

The company also unveiled a campus backbone switch, two access concentrators and an ATM card for its high-end PBX (see graphic, page 82).

Bill O'Shea, president of Lucent's Business Communications Systems Group, said the company is beginning what it hopes is a march into the upper ranks of the internetwork market.



Lucent's Bill O'Shea is eyeing the whole enchilada.

"We're not going to get there in any one announcement," O'Shea conceded. But he said Lucent also is developing products for the Fast Ethernet and Gigabit Ethernet markets. In addition, he confirmed reports that Lucent is working on its own Ethernet switch for delivery about a year from now.

Last week's coming-out party was not the first time Lucent has

Cisco revamps remote gear

AS5300 doubles density of earlier remote access server.

By Jim Duffy
San Jose, Calif.

Cisco Systems, Inc. is about to double the capacity of its high-end remote access server, a move that will speed Internet and intranet access for its larger users.

The company this week is

expected to announce its next-generation universal access server, the Cisco AS5300, which is designed to support the growing volume of dial-in connections to corporate intranets and service provider networks.

See Cisco, page 82

Mark Your Calendars!

Be there when we convene a panel of experts from the industry's top Gigabit Ethernet vendors for a frank, open debate about the future of this promising technology.

Participants from Alteon Networks, Bay Networks, Extreme Networks, Foundry Networks, Prominet and 3Com will field questions from Kevin Tolly of The Tolly Group, Don Miller of Dataquest, and Network World's own John Gallant and Jodi Daniels. Don't miss it.

Where:

NetWorld+Interop 97 in Atlanta

When:

12 p.m., Thursday, Oct. 9,
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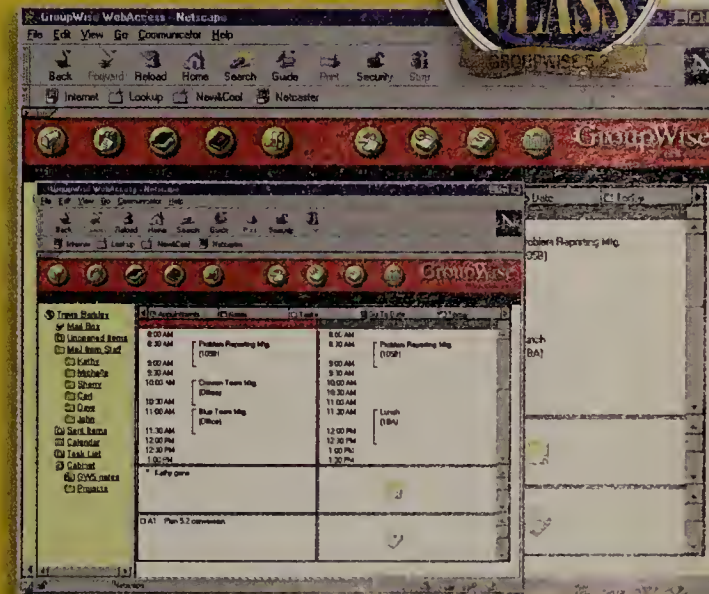
Improved Internet gateways and Web access take Novell's groupware product to a new level.

By Travis Berkley

Novell, Inc.'s GroupWise has long been a high flyer for group connectivity. With Version 5.2, which shipped last week, the program successfully docks with the Internet and brings new 'Net standards into its orbit. It weighed in with an impressive 9.5 score in our test, enough to earn our World Class Award.

With Version 5.2, Novell heeded user demands. For example, Post Office Protocol 3 (POP3) services were considered a must-have by many customers. Novell responded by revamping the old Simple Mail Transfer Protocol/Multi-purpose Internet Mail Extensions (MIME) gateway into the new GroupWise Internet Access (GWIA) gateway. GWIA includes not only POP3, but also the

See GroupWise, page 53



With its new look, WebAccess now closely resembles the native 32-bit client.

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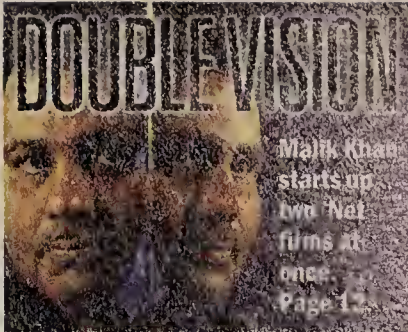
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NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



NETWORKWORLD+INTEROP 97

Interop: Covering all the bases

Keep up with the mass of activities at NetWorld+Interop 97 with our comprehensive planning guide. Here you'll find the hottest sessions, most important keynotes and other valuable events worth attending at the big show in Atlanta. See page 64.

There's more Interop coverage inside. Check out:

- Extranet router start-up New Oak Communications' new gear. **Page 6.**
- GigaLabs' huge Gigabit Ethernet switch. **Page 8.**
- Mariposa's new ATM mux. **Page 25.**

IBM software to ease multimedia apps creation

By John Cox
San Jose, Calif.

Relational database management systems used to only be able to search for information among their own rows and columns. But IBM is building new software that will allow databases to sift through multimedia information stored in an array of outside files.

The software, called DataLinks, may be particularly attractive to companies that want to build Web applications with dynamic access to images, audio, video or text housed on Windows NT or Unix

See DataLinks, page 83



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See Cisco, page 82

Spammers beware: Usenet2 not for you

By Sandra Gittlen

With spam threatening to choke Usenet to death, a group of regulars has taken it upon themselves to fix the problem. Their answer: Create Usenet2.

Usenet2 employs the same underlying infrastructure as the original network-based bulletin board, which hosts discussions on topics ranging from Cisco routers to dirt biking. It also includes feeds from other Usenet sites and

Internet service providers. However, Usenet2, employing monitoring software and a strict set of community rules, limits access to the user group by preventing spam or sites forwarding spam mail to gain access.

Spam is the mass mailing of messages to numerous discussion groups, whether the messages are relevant or not. This causes chronic problems within the Usenet

See Usenet2, page 14

GROUPWISE GETS WISER

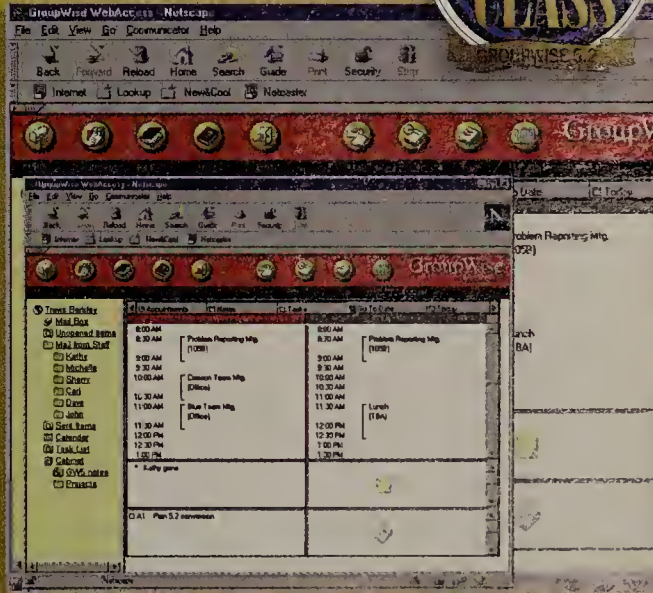
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See GroupWise, page 53



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How to be sound: Usenet2 (U2) rules

"All U2 sites are sound. A sound site only accepts articles from other sound sites, and [a] site takes responsibility for the generation and transmission of sound articles. If it can't do that, it's not sound and will not be allowed to transmit articles into U2. . ."

Get more online:

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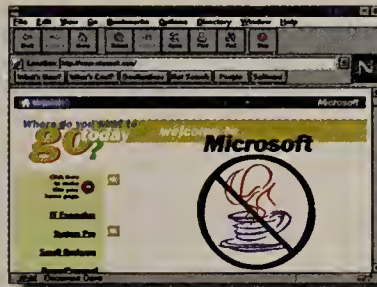
BEYOND BROWSERS

Marc Andreessen outlines what's ahead for Netscape. Page 33.



JUNKING JAVA

Microsoft will wipe most of the Java applets off its Web site. Page 10.



FAST FIREWALLS

WatchGuard and Radguard separately bring their firewall technologies to Fast Ethernet LANs. Page 34.



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This Week

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Keeping Current. Service-level agreements (SLA)? More like service-level arguments, says Fred McClimans. In a doom-sayer's guide to SLAs, McClimans warns users not to expect real implementation of them anytime soon. He also advises readers on what to think about as you head off to those vendor meetings at NetWorld+Interop 97. **DocFinder: 3935**

Interop. Speaking of the big show, come online for our complete news roundup and show planner as well as the *Complete Outsider's Inside Guide to Atlanta*. Forget those boring guides that describe nearby hotels — we'll give you the exclusive insight about how to cook kudzu and talk southern. **DocFinder: 3928**

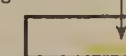
Front page

Switches. Read our article on Lucent's new switch offerings. Then connect to Fusion for papers on connection admission control algorithms, which Lucent says enhances its switches. **DocFinder: 3932**

Remote access. When you're done with our look at Cisco's latest remote access server, come online for overviews of remote access gear from Cisco and other vendors. **DocFinder: 3933**

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REVIEW: *GroupWise gets wiser. Improved Internet gateways and Web access take Novell's groupware product to a new level.* Page 1.

REVIEW: *Distributing the Web load. Cisco's Local Director tops over test of four Web server load balancers.* Page 57.

News briefs, September 22, 1997

Lost (and found) in space

Two planned services based on bouncing signals off a ring of satellites in Low Earth Orbit were on different tracks last week. Iridium LLC, a venture backed by Motorola, Inc. to provide global phone calling over a single handset, launched seven satellites, bringing its total to 29. That is nearly half of the 66 satellites Iridium needs to begin service a year from now.

On the other hand, Teledesic Corp., a planned 288-satellite Internet access service financially backed by Microsoft Corp. Chairman Bill Gates, lost a key government license. The Federal Communications Commission canceled its pioneer's preference program, nixing a giveaway of wireless spectrum to Teledesic and 12 other companies deemed to be technologically innovative.



Ilene Lang

AltaVista, hasta la vista

Digital Equipment Corp. has lost the head of its AltaVista Web search engine division, company officials said last week. Reportedly, Ilene Lang, AltaVista Internet Software, Inc. vice president, quit her post earlier this month because she was not happy with Digital's decision not to take AltaVista public. In late June, Digital Chairman Robert Palmer announced the abandonment of the AltaVista initial public offering and the reintegration of the business into the company's product division.

NetTech takes a nose dive

Network management software maker NetTech, Inc., based in Raleigh, N.C., has gone under. Calls to the company are referred to a local law firm for questions. The law firm claims NetTech filed for Chapter 11 bankruptcy liquidation procedures on Sept. 12. No other information was disclosed. NetTech software went into management products offered by Cisco Systems, Inc. and Cabletron Systems, Inc. The bankruptcy will not affect the products those companies offer, executives said. The rights to NetTech's technology probably will be auctioned off by court order, sources said. The company was founded in 1990 by a group of IBM software engineers.

Cisco goes POP

Cisco Systems, Inc. this week will announce CiscoSecure GRS, a global roaming server that allows mobile users to dial into local Internet service provider's points of presence (POP) for Internet access instead of making an expensive long-distance call to a central site. Cisco also will announce availability of the CiscoSecure ACS 2.0 security server for Windows NT. CiscoSecure GRS costs \$52,500 and will be available in November. CiscoSecure ACS 2.0 for Windows NT is available now for \$3,000.

Toll-free numbers running out again

In a replay of events from two years ago, the Federal Communications Commission is soon likely to begin rationing toll-free telephone numbers. The Alliance for Telecommunications Industry Solutions (ATIS) reported that more than 401,000 toll-free 888 numbers were taken during August, a pace that would leave none available before the new 877 toll-free code goes into effect next April. ATIS asked the FCC to order all carriers to reduce their assignments of 888 numbers until then. The FCC took similar action in 1995 to hold back 800 numbers until 888 went into effect.

Toasted Taligent

IBM officials last week announced they have officially dissolved the company's Taligent subsidiary and will absorb its approximately 100 employees into a number of other application-development efforts. Some of those programmers are expected to work in the recently announced Java porting center that IBM is setting up with Sun Microsystems, Inc. and Netscape Communications Corp.

Start-up unveils extranet switch for remote access over Internet

By Chris Nerney
Acton, Mass.

NETWORK+INTEROP 97

A start-up that calls itself an "extranet access" hardware provider today announced a product designed to eliminate the need for remote dial-in equipment and services.

New Oak Communications, Inc. said its NOC 4000 access switching device, now in beta, will enable corporations to provide customers, partners and remote employees with secure access to their networks through the Internet.

The NOC 4000 is a box that includes software for TCP/IP routing, tunneling, encryption, quality of service and firewall security, said New Oak President and CEO Jeff McCarthy.

"Right now, remote workers dial in to a server to get access to a network," McCarthy said. "If you dial in to the Internet instead, you're making a local phone call."

Large costs are incurred using remote dial-in — includ-

ing access servers, dial-up ports and leased lines. "By replacing remote access, large companies can easily save \$1 million a year per thousand users," McCarthy said.

The NOC 4000 customizes access for each user, creating "personalized extranets," he said. The product can identify each user and assign the appropriate performance level, type of access and security, McCarthy said.

With the NOC 4000, users would dial in from remote sites. Instead of connecting directly to the network and incurring long-distance charges, they would access the Internet via a local connection and "tunnel" into the NOC 4000 box.

Founded last year by former Forrester Research, Inc. analyst

Tom Pincince, New Oak is one of the latest companies trying to capitalize on the growth of extranets, which extend a company's network outward over the Internet.

New Oak reportedly has signed up several beta customers for NOC 4000, including AT&T,

Fidelity Investments and GTE Labs, though McCarthy would not confirm this.

The NOC 4000 sits on the edge of the corporate enterprise between the public and private network. The WAN side of the box can handle up to six T-1 lines or one T-3 line, while the LAN side provides 10/100 switched Ethernet ports.

A commercial version of the product is scheduled for November release. The NOC 4000 supports from 200 to 2,000 users and is priced at \$50,000. ■



New Oak's Jeff McCarthy: "The world is moving toward using the Internet to form extranets."

Compaq and Intel unite to attack network market

Vendors plan to roll out NICs, switches, hubs and RAS.

By Jodi Daniels

Compaq Computer Corp. and Intel Corp., two of the computing industry's most powerful companies, last week said they are joining forces in the network market.

According to the companies, the partnership will involve joint product development and marketing in the Gigabit Ethernet, xDSL and remote access server markets, among others. One of the key areas the firms will target is the migration from Fast to Gigabit Ethernet.

While the companies provided few product or shipping specifics, analysts said the PC powerhouses appear poised to go harder than ever after the likes of network giant 3Com Corp., which already competes directly with them in the Fast Ethernet switch and adapter markets. Analysts also said the agreement could lower network equipment prices.

Over the past few years, Com-

paq and Intel already have started to make their presence felt in the network industry through a series of acquisitions. Each vendor also has partnerships with network heavyweights such as Cisco Systems, Inc. For

example, Cisco provides Intel with Gigabit Ethernet and Fast EtherChannel technology, while Cisco provides Compaq with its IOS routing software.

Even as the Compaq-Intel alliance was being announced last week, 3Com crashed the party. It reported that it is in the final stages of talks with Compaq to supply it with NICs for its PCs. Intel, which integrates adapters on PC motherboards, categorized the 3Com announcement as a defensive move. ■

Be a

NET KNOW-IT-ALL

For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2349 in the DocFinder box.

This week's question:

What videoconferencing vendor did Vtel Corp. merge with earlier this year?

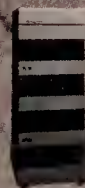
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GigaLabs unleashes monster Gigabit Ethernet switch

By Jodi Daniels

In one word, it's big. GigaLabs, Inc. last week rolled out a supersize gigabit switch that some industry observers say is overkill and overpriced.

Also last week, Accton Technology Corp., Newbridge Networks, Inc. and Performance Technologies, Inc. separately unveiled LAN switches, all of which will be on display at NetWorld+Interop 97 next month in Atlanta.

But the highlight of the pack was GigaLabs' 32-slot backbone chassis. The GigaStar 8000 — perhaps the highest capacity box in the industry — provides a total backplane capacity of 128G bit/sec and supports Gigabit Ethernet and High Performance Parallel Interface technology.

While the switch supports port-based and media access

control (MAC)-based virtual LANs, it does not provide key features such as Layer 3 switching.

NETWORLD+INTEROP 97

"Most of the Gigabit Ethernet companies are being very aggressive about adding intelligence — like routing — to their switches, whereas [GigaLabs] is throwing a giant switch matrix and lots of slots," said Mark Leary, director of LANs at International Data Corp., a Framingham, Mass.-based market research firm.

"They are taking the tack that bigger is better, but there is a big premium to pay for that raw bandwidth," Leary said.

Customers looking for a box with big-time slots and performance to throw into the core of their networks may want to

look at the GigaLabs product, Leary said.

The top-of-the-line GigaLabs' box will compete with high-end offerings from Gigabit Ethernet start-ups such as Extreme Networks, Inc., Foundry Networks, Inc. and Rapid City Communications, Inc., which is now a division of Bay Networks, Inc.

"These vendors' products don't have the slot counts that GigaLabs presents, but they are attacking the router replacement problem right out of the chute via Layer 3 switching," Leary said.

GigaLabs does not plan to offer Layer 3 capabilities until the second quarter of next year.

Leary also pointed out that while the GigaStar 8000 has a high slot count, its port density is fairly limited by one-port modules.

But one thing for sure is the box's high price tag.

"This thing is offering the ultimate in performance at the ultimate price," Leary said. "It's about \$350,000 for the non-redundant configuration, and if you're operating a switch at this level and you're not buying redundancy, you're a fool."

Switch mix

Here is what the other vendors announced:

- Accton rolled out its CheetahSwitch family of Fast Ethernet switches. They provide auto-sensing, prevent packet loss through back-pressure flow control and operate at wire speed.

- Newbridge unveiled the MLS 500 Ridge Module for its top-of-the-line switch chassis (previously UB Networks, Inc.'s GeoLAN/500).

The Multi-Protocol over ATM-based module provides one 155M bit/sec ATM port with a redundant link. The card brings Layer 3 switching capabilities to the 500 chassis for the first time.

- Performance Technologies rolled out the Nebula family of LAN switches, which includes workgroup, department and backbone devices. Features include advanced protocol/broadcast/MAC filtering, a WAN port option, automatic VLAN construction and SNMP management.

Vendors prep switch blitz for Interop

Vendor	Product name	Description	Pricing	Availability
Accton	CheetahSwitch	Eight- or 24-port Ethernet switch with two Fast Ethernet uplinks	Eight-port version starts at \$895; 24-port version starts at \$2,495	Now
GigaLabs	GigaStar 8000	32-slot Gigabit Ethernet switch chassis	Starts at \$350,000	Year-end
Newbridge	MLS 500 Ridge Module	One-port 155M bit/sec ATM uplink module with MPOA support	\$19,995	Q4
Performance Technologies	Nebula 4000	16-port Fast Ethernet workgroup switch	\$7,595	Q1
	Nebula 6000	64-port switching hub, where every four ports share a switched segment	\$10,995	Q1
	Nebula 8000	32-port Fast Ethernet backbone switch	\$28,995	Q1

Nipping bad applets in the bud

DSN, Internet Security Systems ready new products.

By Ellen Messmer

Every day the chances get better that someone in your organization will download a hostile ActiveX or Java applet off the Internet. Fortunately, the number of products available to deal with the problem is growing.

In the coming weeks, DSN Technology, Inc. and Internet Security Systems, Inc. (ISS) will join the fight by announcing ways to stop hostile applets before they infiltrate desktops.

Tampa, Fla.-based DSN is working on what it calls a distributed firewall. The plan is to put software on the desktop that prevents the downloading of any kind of executable code deemed undesirable.

The client software is controlled from a centralized management station. Besides filtering out bad applets, the software could control what the desktop can send out to the Internet or outside the LAN, said Gary Brooks, DSN's director of marketing. DSN expects to have a free evaluation version of the distributed firewall available by the end of the month. Final product shipment is scheduled for November.

Also intent on slaying evil applets is Atlanta-based ISS, which makes the RealSecure attack-recognition product for

monitoring attempted break-ins through the Internet.

The next version of the product, RealSecure, is expected to ship by year-end. The product sits behind the corporate firewall and will be able to detect ActiveX, Java or "even Shockwave code," said Patrick Taylor,

ISS vice president of marketing.

RealSecure would not let the downloadable executable code through if it originated from an undesirable place — such as anywhere from an .edu domain, for instance. Universities have been an Internet security problem area for many years.

Once a problem applet is identified, there are several ways to proceed. "If we catch the stuff on the network, we'll kill the con-



ISS' Patrick Taylor says RealSecure can defend against hostile applets.

nection to the Java applet or make other responses, such as sending e-mail to the security coordinator or simply logging the event," Taylor said. ■

CORRECTIONS

The Sept. 15 issue of *Network World* listed an incorrect time for the Gigabit Ethernet Face-Off to be held at NetWorld+Interop 97 in Atlanta. This presidential-style debate among top vendors will be held at noon on Thursday, Oct. 9 in Room 202 East of the Georgia World Congress Center.

A Sept. 15 page 1 article should have stated UUNET, not Sprint, offers an end-to-end service guarantee with its ExtraLink service.

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Microsoft annihilates Java applets

By Todd Wallack
Redmond, Wash.

Microsoft Corp. said it is committed to making sure Java runs best on Windows. But the company apparently was not talking about its Web site. The software giant has decided to pull nearly all Java applets off its site, claiming the programs run too slowly and are difficult to maintain.

just wasn't worth the effort."

But the move raises questions about how committed Microsoft is to the language. Microsoft officials said they want to make sure Java runs best on Windows; they even plan to fine-tune Apple Computer Inc.'s Java Development Kit as part of Microsoft's recent deal with the struggling computer maker.

soft's concern about Java. In many cases, Java competes head on with Microsoft's own products, such as ActiveX Controls.

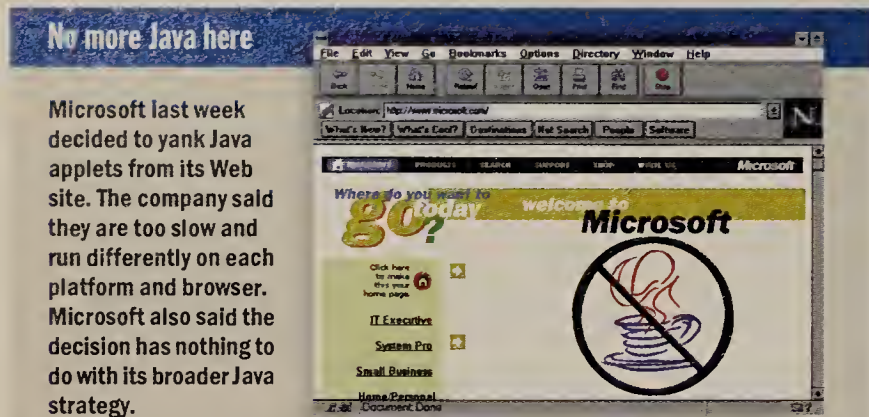
"It's not too surprising that Microsoft wants to use its own technology on its Web site," said Chappell, who gives seminars on ActiveX. "It's become a cliché, but it's true: Microsoft likes Java the language, but they don't like the Java environment."

But Sinclair said the decision has nothing to do with the company's overall strategy. He said he made the decision last week on his own as an IS worker trying to run a highly trafficked Web site. Microsoft.com draws one million users and 20 million hits per day, he said. Sinclair said C/Net, Amazon.com and other sites also have tossed out applets recently for similar reasons.

Indeed, he said Microsoft's Web site will continue to use JavaScript — because it is simpler and lighter — and will even use applets when necessary. "This doesn't mean all Java applets will be banned," Sinclair said.

Microsoft's site currently has about 500 to 600 applets scattered on its 300,000 pages. Sinclair plans to gradually remove them over the next couple of months. ■

But Sun Microsystems, Inc. has accused the company of trying to sabotage the language by encouraging developers to mix in bits of code designed to work on Windows. The Web site decision could add fuel to those concerns. David Chappell, a principal at Chappell & Associates in Minneapolis, said the move clearly underscores Micro-



Tim Sinclair, editor in chief of microsoft.com, said information systems workers have had to spend too much time tailoring applets for each platform and browser. Like IS workers at other companies, Sinclair said the Java mantra of "write once, run anywhere" is exaggerated. "Testing all the permutations... is just a huge expense," Sinclair said. "It

Exchange 5.5 preview package is unveiled

Customers laud product's expanded message store.

By Paul McNamara
Redmond, Wash.

With customers set to converge on Exchange Conference 97 next week in San Diego, Microsoft Corp. has made available an evaluation release of Exchange Server 5.5 designed to squelch scalability gripes di-

rected at the messaging/ groupware product.

Users say they are anxious to see the Exchange Enterprise Edition message store expanded from its current 16 G-byte capacity to what Microsoft calls a maximum limited only by the hardware being used.

Also included in Version 5.5 will be Microsoft Cluster Server support that lets one server take over for another; a scripting agent that will let users create collaborative applications and simple workflow; an enhanced ability to recover deleted messages; and versions of the Outlook client for Windows 3.X and Macintosh operating systems.

According to one

industry analyst, the upgrade is particularly important to Microsoft because Version 5.5 is to be the last major upgrade of Exchange until after the company's NT Server 5.0 network operating system ships in the second half of 1998.

"It remains to be seen whether [the Exchange 5.5] they ship is something you'll want to have around in the industry for a year," said Eric Brown, an analyst with Forrester Research, Inc., in Cambridge Mass. "There's a lot riding on this release."

One customer who already has installed Exchange 5.5 beta code on four servers is more than pleased with the results. "With 2,600 students on a single [post office], the 16 G-byte limit was a major limitation," said Greg Scott, IS manager for the College of Business at Oregon State University. "With Exchange 5.5, we have been able to double the space we grant to students for mail and attachments... a significant service improvement."

Another Exchange customer sees the upcoming release as an opportunity for economizing in

NEW IN EXCHANGE

- Message store increased from 16G bytes to whatever the hardware will bear
- Support for S/MIME and X.509 Version 3 certificates
- Cluster server support for failover protection
- A connector to Lotus Notes
- Exchange Chat Service
- Better ability to recover deleted messages



Novell expands its BorderManager suite

By Christine Burns
New York

Three weeks after shipping BorderManager, Novell, Inc. last week added two products to the 'Net access management suite.

BorderManager FastCache is a proxy cache that improves performance and reduces the bandwidth and server resources necessary to deliver Web access to corporate users. And BorderManager Authentication Service gives organizations centralized, secure control of remote access connections using industry standard Remote Authentication Dial-In User Service (RADIUS) technology. Novell CEO Eric Schmidt said these are the first of many products that will build on BorderManager.

"It's good to see they are expanding in the right directions," said Fred Towery, computer science instructor at San Jacinto College in Houston, which uses BorderManager to set up virtual private network (VPN) links for long-distance learning programs.

FastCache is the same Internet Cache Protocol-based proxy cache that currently ships with the BorderManager suite. As a stand-alone product, FastCache can be set up as a single proxy cache or a Web server accelerator. It also can be used with other caching products to speed up the delivery of Web content to end users.

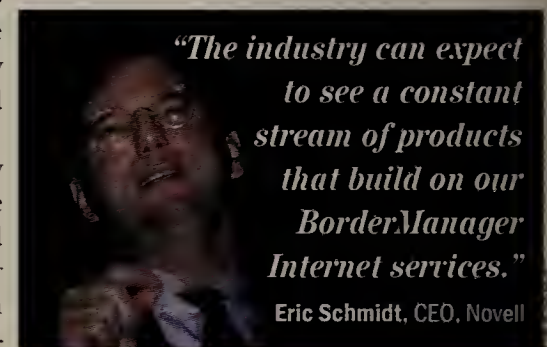
Michelle Arden, vice president of the BorderManager division, said FastCache is being pulled from the BorderManager bundle per customer request. While most companies will deploy only one BorderManager

suite to control Web access, most wanted to set up several caching servers to further speed up network performance without having to buy the whole suite.

FastCache servers store frequently accessed Web pages so users see a marked improvement in the delivery of content via the 'Net or corporate intranet.

"I am glad that they are finally listening to what we need," said George Mosek, a network analyst with the National Board of Medical Examiners in Philadelphia.

BorderManager FastCache, which can reside on an IntranetWare, Windows NT or Unix box,



will ship in November. Pricing has not yet been determined.

BorderManager Authentication Service sits on top of a BorderManager server. It allows a network administrator to control access for remote users accessing the network via RADIUS-compliant hardware.

This product has strong ties with RADIUS Services for Novell Directory Services, enabling administrators to regulate network access based on the RADIUS profiles defined in NDS.

BorderManager Authentication Service, which will run on either IntranetWare or NT, will ship early next year. Pricing has not yet been determined.

© Novell: (800) 233-3382

his shop. "Being able to run e-mail on one Exchange server instead of many means fewer servers to backup, patch, reboot, maintain, defragment and so on," said Patrick El-Azem, a systems administrator at Neurotec International Corp., a Boston-based software company. "This saves money in conceptually unneeded hardware, and leaves me more time to concentrate on failover, redundancy, etc."

In conjunction with the larger maximum message store,

the backup performance capability in Exchange 5.5 will be increased to 15G bytes per hour.

The upgrade also will add support for Secure Multi-purpose Internet Mail Extensions, X.509 Version 3 certificates, Internet Message Access Protocol 4 and Lightweight Directory Access Protocol Version 3.

Microsoft has yet to reveal pricing information for Exchange Server 5.5, which is slated to ship before year-end.

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Emerging Technologies

Two Internet start-ups are better than one

Former Motorola executive Malik Kahn is playing dual role of Sitara's CEO and Indus River's chairman.

By Bob Brown

Entrepreneur Malik Khan is living a double life.

He spends most workdays as CEO of Sitara Networks, Inc., the Waltham, Mass., company he formed last year to develop products for speeding corporate Web access. At the same time, the former Motorola, Inc. vice president is on call as chairman of Indus River Networks, Inc., another company he started last year. Indus River is focused on virtual private networks.

"I couldn't really give up either one," said

Khan, who grew up in Pakistan in the shadow of K2, the famous Himalayan mountain he planned to name one of his start-ups after until he learned another company had taken the moniker.

While Khan's dual duties are unusual, it is easy to see why the



Malik Kahn is doubling his pleasure with start-ups Sitara and Indus River.

40-year-old executive would want to keep his fingers in two Internet pies: Customer demand for more useful Internet products is booming, and investors are practically throwing money at start-ups that even hint at meeting this

customer demand. A recent Price Waterhouse survey of venture capital companies, for example, found that Internet start-ups garnered \$561 million in funding during the second quarter alone.

Joining the race

Khan joined the start-up race after spending 12 years at Motorola. Most recently, he was vice president and general manager of the company's Network Systems Division, which specializes in cable modems, routers and frame relay access devices.

Kahn left the company in May 1996 "after being bitten by the Web bug." He joined OneLiberty Ventures in June last year as the Boston-based venture capital firm's entrepreneur-in-residence. While there, he and several contacts came up with the ideas for Sitara and Indus River. He left the venture firm two months later with funding from

OneLiberty for both companies.

"I started to understand the compelling economic benefits of using the Web for business. But I also thought that the Internet needed to get fixed before companies would rely on it to do business," said Khan, who has raised more than \$17 million for his two companies.

Khan is keeping much of the Sitara and Indus River product plans under wraps, so it is difficult to say how his companies will stand out from the hordes of emerging Internet start-ups.

But he did reveal a few tidbits. Sitara's first product will be a software package called Sitara SpeedServer and will probably be introduced in December at Fall Internet World in New York.

The software will run on a machine next to a company's Web server and enable end users to access pages three to eight times faster than they can now. End users will be able to download Sitara client software for free and use it whenever they access a Sitara-enhanced Web site. Sitara's software works by controlling and optimizing the flow of information between the end user and the Web site, though further details aren't yet available.

The company last week said it closed on a second round of financing, worth \$7 million, and has 30 employees.

Indus River, on the other hand, took shape following discussions between Khan and Wray West, an engineer formerly with Primary Rate, Inc. The discussion centered on using the Internet to add network capacity to corporate networks. Khan then

persuaded Per Suneby, who had worked for him at Motorola, "to leave his nice, cushy job and take this crazy flier on this start-up" as its CEO. Suneby, who described Khan as "a person who can get people excited about something," said Indus River is working on its first product and most likely will introduce it next year.

Khan insisted that juggling his CEO job at one company and chairman position at another isn't as wacky and wild as it may seem. But he is very involved with both companies, handling day-to-day responsibilities at Sitara and keeping a hand in major decisions at Indus River.

"Per is more interested in hearing my opinions than having me impose my ideas on Indus River. But I do get involved in key issues—from general strategy to customer presentations to hirings to architectural changes in products," Khan said.

Describing a recent day, Khan said he arrived at Sitara around 8 a.m. and met with the company's vice president of engineering for an update on the previous day's product development progress. Khan then made calls to and returned calls from prospective customers, potential partners, venture capital partners and potential employees. He then touched base with Indus River's Suneby. During the afternoon, Khan participated in marketing and business development meetings, chatted with friends for advice on business issues, talked financials with Sitara and Indus River Chief Financial Officer Mike Palin, went over some legal issues with lawyers and then called his wife before heading home at around 7 p.m.

Khan, whose wife delivered the couple's fifth daughter on Labor Day, said he is enjoying all of the action at home and at work. "I've definitely got my hands full," he said. "But I'm loving it." ■

More bumps in the road for 56K modems

By Tim Greene

Motorola, Inc. has thrown another monkey wrench into efforts to develop a standard for 56K bit/sec modems.

At the expense of a quick agreement on a single fast-modem technology, Motorola is apparently joining the ongoing battle to dominate whatever standard is finally reached.

The weapon of choice: royalty fees it will charge competitors that want to license its patents.

Because of hassles over how much various parties will charge for technology rights, engineers at a recent meeting of the standards body, the International Telecommunication Union (ITU), had to adjourn without reaching a hoped-for preliminary standard. The earliest they can try again is February.

In meetings outside the ITU's technical discussions, Motorola was demanding what one committee member described as high per-unit royalties.

"Many modem vendors, both small and large, find these demands for high per-modem royalties that continue over the life of the patent to be excessive," said Ken Kreechmer, a

member of the ITU standards committee.

The 56K bit/sec modems need to talk to the installed base of slower modems, and that is where Motorola holds patents.

Patent wars

Major modem vendors have a long history of battling over rights to modem technology.

1995 - Motorola sues Rockwell over modem patents.

Feb. 1997 - Motorola drops suit against Rockwell; endorses Rockwell 56K bit/sec modem technology; sues U.S. Robotics, now 3Com, over modem patents.

April 1997 - 3Com sues Motorola over royalties Motorola charged for modem patent rights.

Sept. 1997 - 3Com announces it has negotiated with Brent Townshend, who claims fundamental rights to 56K bit/sec modems; 56K bit/sec modem standard delayed because of patent wrangling.

Motorola did not provide a spokesman to comment.

Lucent Technologies, Inc., with claims to two 56K bit/sec patents, said it will license them

"under reasonable terms." Lucent will not specify those terms, but no one has complained about them.


Another factor in the royalty issue is a pending lawsuit between Motorola and 3Com Corp. The two companies have been sparring because Motorola backs one of two 56K bit/sec modem technologies called K56flex, while 3Com owns the other, known as x2.


About the time Motorola announced it was in the K56flex camp, it filed a lawsuit against 3Com claiming 3Com owed Motorola patent royalties. 3Com countersued.

John McGill, chairman of the ITU 56K bit/sec modem committee, said Motorola appeared to be working to broker a compromise on the royalty issue, but the lawsuits could be an obstacle.

3Com's bargaining chip in the dispute is Brent Townshend, an independent researcher who has filed claims that he owns the rights to the basic 56K bit/sec modem idea. Townshend has enlisted 3Com as his agent to represent his royalty interests. ■

KHAN'S KINGDOM

Profile: Sitara Networks 
Based: Waltham, Mass.
Founded: August 1996
Products: Intelligent client/server software for fast Web access
Funding: \$5.5 million in first-round financing from OneLiberty Ventures, New Enterprise Associates, Charles River Ventures and private investors; \$7 million in second-round financing from the same companies that provided first-round funding, as well as Prism Venture Partners
Fun fact: The company originally was called K2Net after the famous mountain.

Profile: Indus River Networks 
Based: Acton, Mass.
Founded: October 1996
Products: Virtual private network products that address performance, security and management issues
Funding: \$5.1 million in first-round financing from OneLiberty Ventures, New Enterprise Associates and Canaan Partners
Fun fact: The company is named after the Indus River that flows through Pakistan.

AT&T offers local branding

By David Rohde

AT&T reportedly is considering a plan to allow its brand name to be used by local and wireless carriers as a way to offer end-to-end telecommunications services.

Observers said the initiative could be an effective way for AT&T to make an aggressive move into the local exchange carrier market and speed up its rollout of nationwide digital wireless service.

The danger, they warned, is that it could lead AT&T to reduce its capital spending plans, further retarding the possibility of facilities-based local competition from the big interexchange carriers.

The initial targets for the branding plan, if approved by AT&T's board of directors, will be wireless personal communications services (PCS) carriers.

It may take longer to develop branding agreements with wireline competitive access providers that offer high-capacity local access circuits.

Seven competitive local carriers currently have bulk agreements with AT&T that essentially make them AT&T's local carrier of choice, said Bryan Van Dussen,

director of telecommunications research for Boston-based consultancy The Yankee Group. Under a branding plan, AT&T could offer services across these networks under its own moniker, Van Dussen said.

AT&T is likely to find branding appealing because its plans for local-loop construction "have always been a trump card that, frankly, I don't think they ever intended to play," Van Dussen said.

But an executive with one of those carriers said AT&T has not yet approached it about the idea, and he would be wary of such a plan for fear of scaring off the business of AT&T's competitors.

"That's getting awfully close to the tiger," said Martin McDermott, senior vice president of marketing for American Communications Services, Inc., which has alternative networks in 32 cities. "Once you brand AT&T, MCI or Sprint, you really are AT&T, MCI or Sprint." One likely possibility for a branding deal is NextLink Communications, Inc., a competitive local carrier controlled by Craig McCaw, who built what eventually became AT&T's wireless division. ■

Ascend climbs IP voice ladder

By Tim Greene

Ascend Communications, Inc. wants to talk — or, more precisely, it wants you to talk over IP networks.

Next month, Ascend will announce plans to add voice capability to its MAX wide-area access gear.

Ascend also is eyeing frame relay as a potential transport for voice, another option that lets users form a single voice/data network that can reduce the recurring expense of high-priced phone trunks.

In an interview last week with *Network World*, Ascend CEO Mory Ejabat said he regards voice as a way to expand Ascend's reach beyond Internet service providers and grab more of the enterprise market.

"Of the wide-area switches being sold by our competitors, a majority of them are being sold into the enterprise because of the voice capability," Ejabat said.

Cisco Systems, Inc. has plans to support voice in its routers and access lines as well as in its IGX frame relay/ATM switches.

While Ejabat offered few details about the rollout, he did say MAXes would support voice in the first quarter of next year.

He said voice-over-frame relay support would come later, but that rollout is too far away to specify an exact date.

The Ascend offering could be attractive to users who already have Ascend hardware, according to Bob Nerz, whose company, Network Technology Consulting, in Foxboro, Mass., installs IP voice systems in corporate networks.

Ascend's stature also could raise the image of IP voice networking. "It's been perceived as a penny-pincher's market so far," he said.

ISPs that already own an enormous installed base of Ascend hardware also might be interested. "ISPs are very aggressively looking at Internet telephony and fax over the Internet," said Liza Henderson, senior broadband analyst for TeleChoice, Inc., a consultancy in Verona, N.J.

Ejabat said the addition of voice fits into a larger plan. "We are saying eventually you are going to outsource your network to larger carriers, so you'd better get our equipment. Because if our equipment is used to build the [carrier] network, you'd have to use our remote product that is seamlessly tied into the core of the network," Ejabat said. ■



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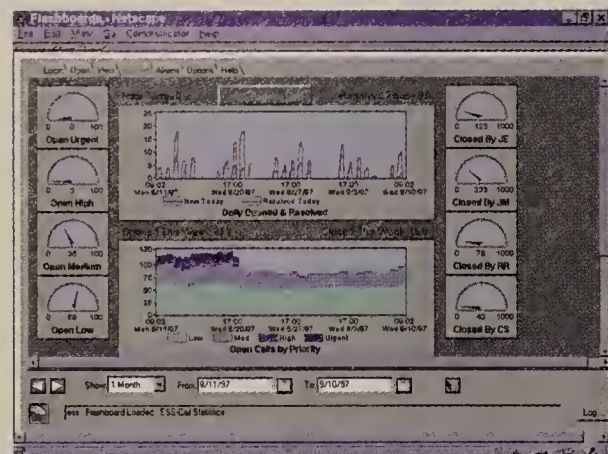
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CA finds Java religion

By Jim Duffy

Computer Associates International, Inc. (CA) last week was baptized at the altar of Java.

The company made good on a promise to add a Java-based Web browser interface for its Unicenter TNG enterprise management platform (NW, June 2, page 23).



Remedy's Flashboards 2.0 allows users to view performance metrics from a Java browser.

Above all else, Java will allow network and systems administrators to view events from any browser-equipped PC, even a laptop. Previously, TNG users could only browse events by using a specialized console at the data center.

"If people wake me up in the middle of the night to ask for my opinion on something, I don't have to make them read me the events over the phone," said analyst Sue Aldrich of Patricia Seybold Group, Inc. in Boston.

CA is the first vendor to provide browser-based enterprise management, including monitoring, administration and control of JavaStations, Java servers, Java applets and the Java Virtual Machine. But being first is no big deal, analysts said.

"Everyone will have some sort of a Java front end at some point," said Paul Mason of International Data Corp. in Framingham, Mass. "I don't think at this point it's a significant competitive advantage."

IBM's Tivoli Systems, Inc. subsidiary is expected to unveil Java-based agent technology for its TME 10 framework by year-end. Tivoli is work-

ing with Sun Microsystems, Inc., the creator of Java, to recast TME 10 into a Java-based architecture.

Analysts do not expect Java to steal the thunder from Unicenter TNG's 3D Real World interface. CA said that virtual reality interface can be accessed from the Java-based browser's graphical user interface.

CA's Java interface will ship by year-end. The company has not determined pricing.

Separately, help desk leader Remedy Corp. also has been

Remote access gets 56K jolt

Ariel and Shiva introduce new dial-up gear.

By Tim Greene

Vendors are cranking up the speed and density of their dial-up access gear.

Ariel Corp. and Shiva Corp. are introducing new hardware that boosts the speed of their remote access gear to 56K bit/sec and gives users more ports on a single chassis.

Ariel's offering, to be announced at NetWorld+Interop 97 next month, is a three-board server package called RASCAL RSI000 that supports 48 56K bit/sec modems as well as ISDN.

RASCAL occupies three slots in a PC-based Windows NT server, allowing users to employ idle slots in network servers to use and upgrade the boxes to remote access servers.

That can reduce costs and conserve space, according to

Steve Curtin, marketing director for Ariel.

The RASCAL cards include a T-1 or Primary Rate Interface ISDN line termination card and two 24-port modem cards.

NETWORLD+INTEROP 97

Any port can handle analog or ISDN calls. Calls can be dropped onto whatever interface the server has with the local network.

PowerPC processors on the card would minimize the load on the server CPU, Curtin said.

The company is working on squeezing even more modems onto three cards, with the ultimate goal of a one-card RASCAL, Curtin said.

The 48-port RASCAL RSI000 costs \$19,500.

Separately, Shiva this week

will announce the LanRover/D56, a remote access switch for small corporate offices that comes in three fixed-configuration models.

Each model supports a single PRI ISDN line and either 23 ISDN calls (\$6,999), 12 modems and 11 ISDN calls (\$8,999) or 24 analog modem calls (\$14,999).

LanRover/D56 will be available in October.

In addition, Shiva this week will ship 12-port cards for its LanRover Access Switch, allowing users to gradually upgrade the switches from 33.6K bit/sec modems to 56K bit/sec modems.

The cards cost \$5,950 each. If customers trade in their slower modem cards bought after May 1, they pay \$1,000 to upgrade to a 56K bit/sec card.

If their old cards were bought before May 1, they pay \$1,750 to upgrade.

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Usenet2

Continued from page 1

community because it congests networks and servers. According to some estimates, as much as 80% of the messages now posted on Usenet are either spam or spam "cancels" — messages that try to delete spam from servers around the world.

Several service providers already have signed on to Usenet2. These include one of the oldest ISPs, PANIX in New York, and newsgroup reader DejaNews, Inc., said Peter da Silva, a leader of the Usenet2 movement and a network administrator at Bailey Network Management in Houston. Other ISPs such as ZipDot Com, LLC in Sunnyvale, Calif., and Insync Internet Services, Inc. in Houston also are backing Usenet2.

With Usenet2, system administrators are encouraged to install Unix-based monitoring software, called Net-Monitor, written and distributed for free by da Silva. The software detects binary files and attempts to post messages to more than three newsgroups at once. Such messages are deleted before they are passed on to other Usenet2 sites.

Participating system administrators also agree to a set of rules. Among them: the inclusion of real return e-mail messages in all postings. Many spammers forge e-mail addresses and paths in their postings in an attempt to

block complaints. Violators risk having their Usenet2 feeds disconnected by their server hosts.

It sounds Big Brotherish to some, but according to proponents, it is just what Usenet needs.

"The monitoring is not content-based," said Russ Nelson, president of Crynwr Software in Potsdam, N.Y., which makes TCP/IP software. "There is nothing that can't be posted on Usenet2 that can be posted on Usenet. You just have to agree to be 'sound.'"

"Sound" is the term Usenet2 backers use to describe correct practices on the network. "Unsound" systems have their feeds cut.

Detractors say Usenet2 will add too much overhead to busy system administrators' duties. "There will be plenty of manual monkey work," said Hoyt Hudson, vice president of information systems at InterAccess Co., an ISP in Chicago. "Are [site administrators] really going to have the time?"

Hudson said developing a set of tools and rules for filtering spams and other cross-posts in Usenet would make more sense. "It needs to enforce more identity or accountability... perhaps e-mail authentication at time of posting," he said.

Nelson noted that a group of Usenet2 "czars" oversee postings, relieving individual system administrators of the task. ■

Tivoli acquires Unison for \$170 million

Even though management rival Computer Associates International, Inc. (CA) beat it to the Temple of Java last week, Tivoli Systems, Inc. found time to make its own offering — \$170 million to Unison Software, Inc.

The IBM subsidiary announced a definitive agreement to acquire the Santa Clara, Calif., maker of job scheduling software for distributed computing environments. Each share of Unison common stock will be converted into the right to receive \$15 in cash or IBM common stock, at the shareholder's election. Tivoli and Unison customers will benefit from "one-stop shopping" for distributed job scheduling and enterprise management framework products, said Frank Moss, Tivoli CEO. But some analysts were perplexed by the deal because until now, Tivoli has prided itself on being an open framework with applications supplied by third-party partners. CA, on the other hand, has traditionally been the company to bundle its own applications and framework as a single offering, a strategy repeatedly criticized by Tivoli for being inflexible and limiting customer choice. "They've been banging the drum of independence for so long and now they're saying everybody wants one-stop shopping," said Paul Mason of International Data Corp. in Framingham, Mass. "I can see CA using that as a slogan: 'Frank Moss says people want one-stop shopping.' If this is tactical then I'm not quite sure what the tactic is; if it's strategic it means you have to do more of these [deals]."

Emulating CA is "not quite what we're doing," said Martin Neath, vice president of product development at Tivoli. Tivoli is acquiring "intellectual properties" to add to the core TME 10 framework, Neath said. For example, a subset of Unison's Maestro scheduling services will be embedded into TME 10 at the API level; Maestro applications, with all of the end-user and graphical user interface functionality, will be sold separately from the framework.

"How that validates CA strategy, I don't get it," Neath said.

—Jim Duffy

Congress to debate 'Net copyright legislation

By Ellen Messmer

Washington, D.C.

Country music star Johnny Cash is tootin' mad. Some Web site in Slovenia has posted his song "Ring of Fire" in digital format without his permission. And he wants Congress to do something about it.

What they should do, says the songwriting legend, is move quickly to pass new legislation contained in a bill called The WIPO Copyright Treaties Implementation Act. That would turn into law copyright protection ideas contained in the World Intellectual Property Organization treaties signed by the U.S. and 160 other countries last year. The bill, H.R. 2281, covers Internet content ownership rights and makes it a crime to design equipment or services to bypass technical protections for digital content. "What's right is right, even in cyberspace," said Cash, author of hits such as "I Walk the Line" and "A Boy Named Sue."



Johnny Cash is pushing for the passage of the copyright bill.

At least 30 countries have to ratify the WIPO treaties nationally for them to take effect. Other nations are waiting for the U.S. — the largest exporter of intellectual property with its movies, videos, music and software — to go first.

The U.S. already boasts some of the best copyright protection laws, but the WIPO treaties help the rest of the world catch up.

The entertainment and software industries love the sound of H.R. 2281. But it sounds more like "A Bill Named Sue" to telecommunications companies, online services and Internet service providers. They say it could lead to massive lawsuits

for copyrighted works illegally made available over their networks. Colleges also are worried; they warn that any organization providing Internet access should be, too.

Introduced by the House Judiciary Chairman Rep. Howard Coble (R-N.C.), H.R. 2281 creates a new right called "making a work available to the public"

that could result in copyright infringement lawsuits from those in the entertainment and software businesses, according to the telecommunications industry.

"If somebody posts Johnny Cash's 'I Walk the Line,' they'll go after the telephone company," complained Roy Neel, president and CEO of the United States Telephone Association, to the Judiciary subcommittee last week. "The company can't legally go in and monitor those transmissions," Neel said. "You can't unfairly submit the ISP or telephone carrier to untold liability. There will be lawsuits. Hordes of legal vultures will find any deep pockets they can."

Legal precedent suggests that service providers are already at risk for illegal works made available through their services. In *Playboy* vs. Frena a few years ago, a bulletin board operator was held liable for pictures he claimed not to know about that were uploaded by subscribers.

To protect themselves, the online service providers convinced Rep. Coble to introduce a second related bill, The Online Copyright Liability Limitation Act (H.R. 2180). This bill offers some liability

exemptions for those who provide access to infringing material if they did not initially place it online, did not get a financial benefit from it or did not sponsor or advertise the material. Rep. Coble last week made it clear he wants to combine the two bills as they move forward, a move opposed by other committee members such as Rep. John Conyers (D-Mich.).

Because H.R. 2180 defines a need for the service provider to have profit and knowledge of the stolen content to be held liable, "it will make it more difficult to protect copyright on the Internet than on the street," said Software Publishers Association President Ken Wasch. ■

STUMPED?

If you were in a room with executives from network vendors, what would you ask them? We'll be posting a list of executives and companies with whom our reporters have interviews at NetWorld+Interop 97. Let us know what questions you would pose to them.



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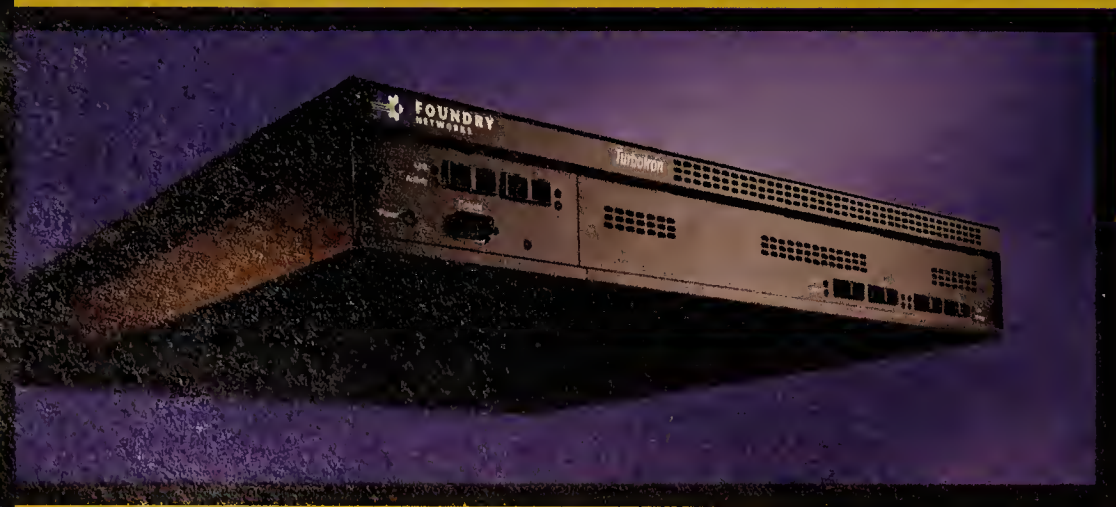
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Briefs

■ **Symantec Corp.**, of Cupertino, Calif., this week will begin shipping **Norton Anti-Virus**



Norton Anti-Virus

4.0. The Windows 95 and NT software checks for known computer viruses as well as new viruses by using artificial intelligence-based reasoning to spot suspect activities.

A single version costs \$49.95; corporate multiuser licenses cost less per desktop.

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■ **Microsoft Corp.** has rolled back the release date of the next version of its Windows desktop operating system in order to accommodate a smooth upgrade path for Windows 3.11 users. **Windows 98**, originally slated to ship in the first quarter of 1998, now will hit the streets in the second quarter.

While the company planned to include tools for migrating Windows 95 machines to Windows 98, it balked at supplying similar wares for Windows 3.11 upgrades. Company officials said the additional testing of the Windows 3.11 upgrade tools will force the delivery delay.

© Microsoft: (800) 426-9400

■ **Artisoft Corp.**, a Tucson, Ariz.-based peer-to-peer network company, will become leaderless next week when CEO **Will Keiper** steps down September 30.

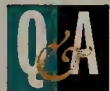
The company said it does not plan to appoint a replacement for Keiper.

The decision has raised industry speculation on how much longer Artisoft can survive. The company's sales and stock prices dropped dramatically when Microsoft Corp. began including peer network software in Windows 95 and NT.

© Artisoft: (800) 233-5564

Taking LAN switch technology to Hart

Chief Technical Officer John Hart shares his outlook for network switches.



3Com Corp. is one of the leading companies in the internetwork market, and its customers are building networks that incorporate just about every technology from ATM to xDSL.

Network World Senior Editor Jodi Daniels recently spoke to 3Com Senior Vice President and Chief Technical Officer John Hart about where networks are headed.

What effect are intranets and Web-based computing having on enterprise nets?

We used to tell folks to put all their servers in the data center, since 98% of the traffic [involved those servers] and use switches to scale the network.

Get more online:
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Then they need to [send the other] 2% of traffic through a router to ensure that nobody sneaks in.

Then in came intranets. All of a sudden, the hypertext links caused people to start bouncing around to all kinds of different servers.

Suddenly, the 2% rule has changed to maybe 30%, and all of those people are now going through that slow router path, which led to the need for more speed.

So now you have started to see a lot of interest in things like Layer 3 switching because we now know that those routers need to be fast, too.

While we're on the subject of Layer 3: How do you expect the Layer 3 switching craze to play out?

Well, Layer 3 switches are

\$600 per port, and Layer 2 switches are \$100 per port. So what that says to me is the first place Layer 3 switches will go is the data center.

Over the next few years, Layer 3 switching will get as low-cost as Layer 2, and then you can expect folks will automatically deploy Layer 3 switches in wiring closets.

But I don't think people would really want a subnet on every port. Would you really want to support that infrastructure?

So we're going to end up with Layer 2 switches with protocols like 802.1p and 802.1q helping [the switches] scale, with Layer 3 functionality layered on top of that.

But Layer 3 switches will replace the collapsed backbone router over the next couple of years. That's definite. How we're going to scale this still needs to

be thought through.

Let's switch gears to the ATM and Gigabit Ethernet battle over the backbone.

Gigabit Ethernet allows many smaller campus network customers to stop thinking about ATM and start thinking of Ethernet in a strategic sense. We see ATM being sold into larger networks looking for quality of service capabilities.

What percentage of customers do you expect to go with each?

Probably one-quarter will go ATM, and three-quarters will go [Gigabit Ethernet]. The majority will go with the LAN approach. But some of the networks that have gone ATM are big networks, and it's a big deal.

What is 3Com's strategy for penetrating more network center installations?

We've always had the belief that there are data center and wiring closet products.

And so our Core-Builder product line is geared right at the switching issues associated with the network core or data center.

But you're right. We're stronger in the wiring closet, and there's a reason for that: We screwed up in the 100M bit/sec space.

Our data center switches just didn't support it soon enough, and we let Cisco in. But I can guarantee you that will never happen again. That's why we're being so aggressive in Gigabit Ethernet. ■



3Com's Hart: "Layer 3 switching will get as low cost as Layer 2."

HP uncorks new high- and low-end Unix-based servers

RISC-based D-Class and Exemplar systems rolled out.

By Marc Songini
Palo Alto, Calif.

Hewlett-Packard Co.'s recent server rollout covered both the bottom and top ends of the market. The company announced two entry-level boxes for small-to-midsize networks as well as new Reduced Instruction Set Computing (RISC)-based machines for running technical applications.

Analysts said HP's announcements are unlikely to rock the server market, which has been rife with new product announcements of late from a variety of vendors.

Rather, HP's products mainly are extensions to existing offerings rather than anything radically new, said Jerry Sheridan, an analyst at Dataquest, Inc., in San Jose, Calif.

HP's new entry-level HP 9000 D-Class servers, Models D280 and D380, run HP-UX and boast

a higher processing speed and more cache memory than their predecessors, the D270 and D370. The servers are powered by one or two HP 180-MHz 64-bit PA-8000 RISC processors and

D380. Both are shipping now.

Up the ladder

On the higher end, the company announced its HP 9000 Exemplar K370, K570 and V2200 servers. The 200-MHz RISC processor machines run HP-UX and support client machines running Unix or Windows NT.

The K370 and K570 are mid-range boxes that can scale from one to six processors. The K370 has 4G bytes of memory, and the K570 has 8G bytes.

The high-end V2200, originally was announced in May as a commercial enterprise server. It is now optimized for technical applications, is scalable to 16 processors and has 16G bytes of memory.

The base K370 unit costs about \$66,500, and the K570 starts at \$86,500. Both units are available now.

The V2200 starts at \$157,000 and will be available in November.

© HP: (800) 752-0900

Slew of servers

HP's new Unix-based machines:

Server	Target applications
▶ HP 9000 D280 and D380	Entry-level commercial
▶ HP 9000 K370 and K570 Exemplar	Midrange technical and commercial
▶ V2200 Exemplar	High-end technical and commercial

have 3G bytes of memory and 2M bytes of cache. The D280 has two disk drive bays and five I/O slots; the D380 has five drive bays and eight I/O slots.

Pricing for the D280 starts at \$25,450 and at \$30,490 for the

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Taking control of software updates

It's not too soon for you to begin preparing for Electronic Software Distribution (ESD).

As I mentioned in last week's column, ESD within the next two years will become the typical way of distributing applica-

tions, updates and bug fixes.

This is especially true given that Microsoft will be building an automatic update feature into Windows 98 and NT 5.0. So if you don't get wise to ESD, your end users will take the initiative away from you by updating their software on their own.

What you want to do is set up a system

under which updates are "pushed" to you from the vendor and tested by you. Then you want to move the updates to a corporate push server — with appropriate scripting to meet your needs, policies and structure — which will distribute updates to end users on a schedule you determine.

To get started, you need to know what's installed throughout your company's network. If you don't already have a software inventory product, get one and start using it. Microsoft's System Management Server and Symantec's Norton Administrator for Networks are among the products that feature software inventory capabilities. However, few products have the granularity you're going to need for tracking each module used by each application as well as common elements such as Dynamic Link Libraries used by multiple applications. I'll examine what's available for inventory products in my Oct. 6 column.

Your next step is to set up a push server and provide end users with push technology on their desktop machines. Microsoft and Netscape are among the companies offering push server and client software, with the clients being **Dave Kearns** their respective Web browser packages. But neither company's server offering features strong software distribution capabilities at this point.

Among the companies with products that will let you get started on ESD right now is BackWeb Technologies (www.backweb.com/pd/products.html).

The BackWeb product family includes a channel server that collects, schedules and controls information; a console that enables easy control of the server even from afar; an editor for easy content development; and a proxy server that allows IS managers to easily manage bandwidth.

The package also includes a client designed to receive information updates across a network. While BackWeb markets its software mainly as a way to distribute content such as Web pages to consumers, its product easily adapts to moving software updates to end users.

While to some extent the tools needed to get started with ESD are still works in progress, I encourage you to start looking at what's out there.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@uquill.com.

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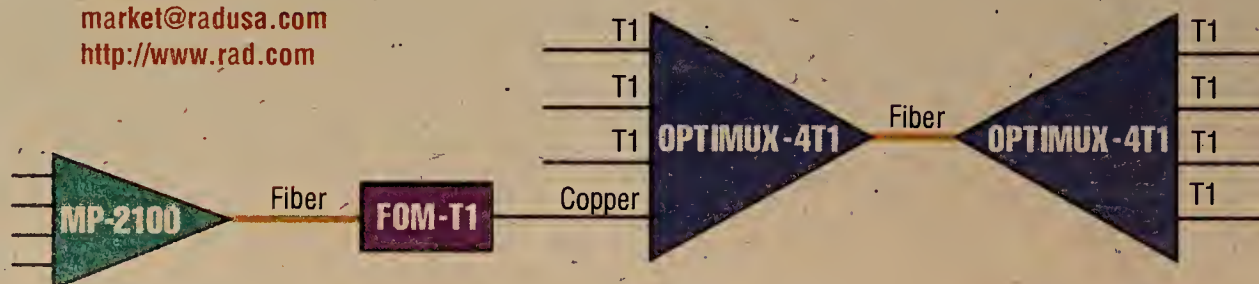
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Tip of the week

A good way to stay on top of breaking news about Windows is to subscribe to Paul Thurrott's Wininfo Digest. Send e-mail to wininfo-request@lists.best.com with the word "subscribe" as the message body.

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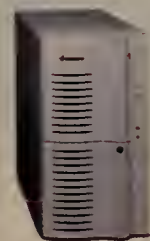


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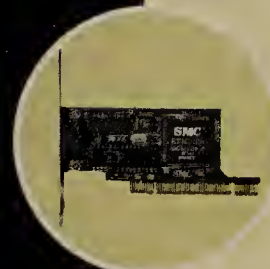
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- | | | |
|-----------------------------------|-------------------------------------------------------------------|--------------------------------------------|
| 1. \$50 Million or more | A <input type="checkbox"/> Large Systems (Mainframes/Minis) | H <input type="checkbox"/> Internet |
| 2. \$25 Million to \$49.9 Million | B <input type="checkbox"/> Desktops (Micros/Laptops/Workstations) | I <input type="checkbox"/> Intranet |
| 3. \$10 to \$24.9 Million | C <input type="checkbox"/> Servers | J <input type="checkbox"/> Remote Access |
| 4. \$1 to \$9.9 Million | D <input type="checkbox"/> LANs | K <input type="checkbox"/> Peripherals |
| 5. \$100,000 to \$399,999 | E <input type="checkbox"/> WAN Equipment | L <input type="checkbox"/> Software |
| 6. \$50,000 to \$99,999 | F <input type="checkbox"/> Carrier Services | M <input type="checkbox"/> Service/Support |
| 7. Under \$50,000 | G <input type="checkbox"/> Internetworking | |
| 8. None of the above | | |

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

5 What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (Check one box in each column)

SERVERS		CLIENTS		LANs	
At Location	Entire Org.	At Location	Entire Org.	At Location	Entire Org.
A	B	C	D	E	F
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. \$0,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. \$0,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>
<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>
<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>
<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>

6 What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)

1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)

1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve

4. ☐ Evaluate

5. ☐ Determine the need
6. ☐ None

7 What is the estimated number of employees at your location/in entire organization? (check one in each section)

A. At your location:

1. ☐ Over 20,000 5. ☐ 1,000 - 2,499
2. ☐ 10,000 - 19,999 6. ☐ 500 - 999
3. ☐ 5,000 - 9,999 7. ☐ 499 or less
4. ☐ 2,500 - 4,999

B. Entire organization:

1. ☐ Over 20,000 5. ☐ 1,000 - 2,499
2. ☐ 10,000 - 19,999 6. ☐ 500 - 999
3. ☐ 5,000 - 9,999 7. ☐ 499 or less
4. ☐ 2,500 - 4,999

8

Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

A. Currently involved in purchasing

B. Plan to purchase

INTERNET/INTRANET

- | | |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| A | B |
| <input type="checkbox"/> 01. <input type="checkbox"/> Internet Services | <input type="checkbox"/> S3. <input type="checkbox"/> Remote Access Products |
| <input type="checkbox"/> 02. <input type="checkbox"/> Firewalls/Security/Encryption | <input type="checkbox"/> S4. <input type="checkbox"/> Remote Access Services |
| <input type="checkbox"/> 03. <input type="checkbox"/> Internet Web Servers | <input type="checkbox"/> S5. <input type="checkbox"/> PDAs |
| <input type="checkbox"/> 04. <input type="checkbox"/> Intranet Web Servers | <input type="checkbox"/> S6. <input type="checkbox"/> PCMCIA Devices |
| <input type="checkbox"/> 05. <input type="checkbox"/> TCP/IP Software | <input type="checkbox"/> S7. <input type="checkbox"/> Wireless Data Services |
| <input type="checkbox"/> 06. <input type="checkbox"/> Management/Monitoring Software | <input type="checkbox"/> S8. <input type="checkbox"/> Wireless Data Equipment |
| <input type="checkbox"/> 07. <input type="checkbox"/> Push Technology | <input type="checkbox"/> S9. <input type="checkbox"/> Cellular Equipment & Services |
| <input type="checkbox"/> 08. <input type="checkbox"/> Web Browsers | |
| <input type="checkbox"/> 09. <input type="checkbox"/> Intranet Applications/Groupware | |
| <input type="checkbox"/> 10. <input type="checkbox"/> Search/Retrieval Products (web crawler) | |
| <input type="checkbox"/> 11. <input type="checkbox"/> Internet Development Tools (JAVA, ActiveX, etc.) | |
| <input type="checkbox"/> 12. <input type="checkbox"/> Electronic Commerce Tools | |
| <input type="checkbox"/> 13. <input type="checkbox"/> Internet Telephony | |

LOCAL-AREA NETWORKS

- | | |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| A | B |
| <input type="checkbox"/> 14. <input type="checkbox"/> Local-Area Networks | <input type="checkbox"/> 60. <input type="checkbox"/> Network Management |
| <input type="checkbox"/> 15. <input type="checkbox"/> Network Operating System Software | <input type="checkbox"/> 61. <input type="checkbox"/> Systems Management |
| <input type="checkbox"/> 16. <input type="checkbox"/> Servers | <input type="checkbox"/> 62. <input type="checkbox"/> Security |
| <input type="checkbox"/> 17. <input type="checkbox"/> Print Servers | <input type="checkbox"/> 63. <input type="checkbox"/> Communications Software |
| <input type="checkbox"/> 18. <input type="checkbox"/> ATM Switches | <input type="checkbox"/> 64. <input type="checkbox"/> Terminal Emulation |
| <input type="checkbox"/> 19. <input type="checkbox"/> Token-Ring Switches | <input type="checkbox"/> 65. <input type="checkbox"/> Operating Systems |
| <input type="checkbox"/> 20. <input type="checkbox"/> Ethernet Switches | <input type="checkbox"/> 66. <input type="checkbox"/> Applications Development Tools |
| <input type="checkbox"/> 21. <input type="checkbox"/> Fast Ethernet | <input type="checkbox"/> 67. <input type="checkbox"/> Database Management/VRDBMS |
| <input type="checkbox"/> 22. <input type="checkbox"/> Gigabit Ethernet | <input type="checkbox"/> 68. <input type="checkbox"/> Groupware |
| <input type="checkbox"/> 23. <input type="checkbox"/> IP Switches | <input type="checkbox"/> 69. <input type="checkbox"/> Workflow |
| <input type="checkbox"/> 24. <input type="checkbox"/> LAN Storage/Backup | <input type="checkbox"/> 70. <input type="checkbox"/> EDI |
| <input type="checkbox"/> 25. <input type="checkbox"/> Optical LAN Storage/Backup | <input type="checkbox"/> 71. <input type="checkbox"/> E-mail |
| <input type="checkbox"/> 26. <input type="checkbox"/> Disk LAN Storage/Backup | <input type="checkbox"/> 72. <input type="checkbox"/> Desktop Video Conferencing |
| <input type="checkbox"/> 27. <input type="checkbox"/> Tape LAN Storage/Backup | <input type="checkbox"/> 73. <input type="checkbox"/> Imaging |
| <input type="checkbox"/> 28. <input type="checkbox"/> RAID LAN Storage/Backup | <input type="checkbox"/> 74. <input type="checkbox"/> Suites/Server Suites (Back Office, etc.) |
| <input type="checkbox"/> 29. <input type="checkbox"/> Network Test/Diagnostic Tools | <input type="checkbox"/> 75. <input type="checkbox"/> Middleware |
| <input type="checkbox"/> 30. <input type="checkbox"/> Cables, Connectors, Baluns | <input type="checkbox"/> 76. <input type="checkbox"/> Document Management |
| <input type="checkbox"/> 31. <input type="checkbox"/> UPS | <input type="checkbox"/> 77. <input type="checkbox"/> Site Metering Tools |
| <input type="checkbox"/> 32. <input type="checkbox"/> Network Interface Cards | <input type="checkbox"/> 78. <input type="checkbox"/> Computer Telephony Integration (CTI) |
| <input type="checkbox"/> 33. <input type="checkbox"/> SNMP Network Management | <input type="checkbox"/> 79. <input type="checkbox"/> Data Warehousing |

INTERNETWORKING

- | | |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| A | B |
| <input type="checkbox"/> 34. <input type="checkbox"/> Routers | <input type="checkbox"/> 80. <input type="checkbox"/> Modems |
| <input type="checkbox"/> 35. <input type="checkbox"/> Hubs | <input type="checkbox"/> 81. <input type="checkbox"/> Asynchronous Transfer Mode (ATM) |
| <input type="checkbox"/> 36. <input type="checkbox"/> Intelligent Hubs | <input type="checkbox"/> 82. <input type="checkbox"/> Frame Relay Equipment/Services |
| <input type="checkbox"/> 37. <input type="checkbox"/> Stackable Hubs | <input type="checkbox"/> 83. <input type="checkbox"/> ISDN Equipment & Services |
| <input type="checkbox"/> 38. <input type="checkbox"/> Bridge/Router | <input type="checkbox"/> 84. <input type="checkbox"/> FT-1/T-1/T-3 Multiplexers/Services |
| <input type="checkbox"/> 39. <input type="checkbox"/> Bridges | <input type="checkbox"/> 85. <input type="checkbox"/> DSL Services/Products |
| <input type="checkbox"/> 40. <input type="checkbox"/> Gateways | <input type="checkbox"/> 86. <input type="checkbox"/> SONET |
| <input type="checkbox"/> 41. <input type="checkbox"/> Concentrators/Repeaters | <input type="checkbox"/> 87. <input type="checkbox"/> Inverse Multiplexers |

COMPUTERS/PERIPHERALS

- | | |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| A | B |
| <input type="checkbox"/> 42. <input type="checkbox"/> Network Computers | <input type="checkbox"/> 88. <input type="checkbox"/> SMDs |
| <input type="checkbox"/> 43. <input type="checkbox"/> Laptops/Notebooks/Sub-Notebooks | <input type="checkbox"/> 89. <input type="checkbox"/> Diagnostic/Test Equipment |
| <input type="checkbox"/> 44. <input type="checkbox"/> Micros/PCs | <input type="checkbox"/> 90. <input type="checkbox"/> DSU/CSU |
| <input type="checkbox"/> 45. <input type="checkbox"/> Minis | <input type="checkbox"/> 91. <input type="checkbox"/> VSAT/Satellite |
| <input type="checkbox"/> 46. <input type="checkbox"/> Mainframes | <input type="checkbox"/> 92. <input type="checkbox"/> PBXs |
| <input type="checkbox"/> 47. <input type="checkbox"/> Workstations | <input type="checkbox"/> 93. <input type="checkbox"/> Voice Mail/Response |
| <input type="checkbox"/> 48. <input type="checkbox"/> Printers/Network Printers | <input type="checkbox"/> 94. <input type="checkbox"/> Videoconferencing |
| <input type="checkbox"/> 49. <input type="checkbox"/> CD-ROM | <input type="checkbox"/> 95. <input type="checkbox"/> Leased Lines |
| <input type="checkbox"/> 50. <input type="checkbox"/> Fax/Modem Boards | <input type="checkbox"/> 96. <input type="checkbox"/> Switched Data |
| <input type="checkbox"/> 51. <input type="checkbox"/> Graphics/Multimedia/Audio/Video Boards | <input type="checkbox"/> 97. <input type="checkbox"/> Virtual Networks |
| <input type="checkbox"/> 52. <input type="checkbox"/> Memory/Chips/Boards/Cards | <input type="checkbox"/> 98. <input type="checkbox"/> Outsourcing/Systems Integration Services |
| | <input type="checkbox"/> 99. <input type="checkbox"/> Education/Training Services |

REMOTE/WIRELESS COMPUTING

- | | |
|-------------------------------------------------------------------------------------|---|
| A | B |
| <input type="checkbox"/> S3. <input type="checkbox"/> Remote Access Products | |
| <input type="checkbox"/> S4. <input type="checkbox"/> Remote Access Services | |
| <input type="checkbox"/> S5. <input type="checkbox"/> PDAs | |
| <input type="checkbox"/> S6. <input type="checkbox"/> PCMCIA Devices | |
| <input type="checkbox"/> S7. <input type="checkbox"/> Wireless Data Services | |
| <input type="checkbox"/> S8. <input type="checkbox"/> Wireless Data Equipment | |
| <input type="checkbox"/> S9. <input type="checkbox"/> Cellular Equipment & Services | |

SOFTWARE/APPLICATIONS

- | | |
|------------------------------------------------------------------------------------------------|---|
| A | B |
| <input type="checkbox"/> 60. <input type="checkbox"/> Network Management | |
| <input type="checkbox"/> 61. <input type="checkbox"/> Systems Management | |
| <input type="checkbox"/> 62. <input type="checkbox"/> Security | |
| <input type="checkbox"/> 63. <input type="checkbox"/> Communications Software | |
| <input type="checkbox"/> 64. <input type="checkbox"/> Terminal Emulation | |
| <input type="checkbox"/> 65. <input type="checkbox"/> Operating Systems | |
| <input type="checkbox"/> 66. <input type="checkbox"/> Applications Development Tools | |
| <input type="checkbox"/> 67. <input type="checkbox"/> Database Management/VRDBMS | |
| <input type="checkbox"/> 68. <input type="checkbox"/> Groupware | |
| <input type="checkbox"/> 69. <input type="checkbox"/> Workflow | |
| <input type="checkbox"/> 70. <input type="checkbox"/> EDI | |
| <input type="checkbox"/> 71. <input type="checkbox"/> E-mail | |
| <input type="checkbox"/> 72. <input type="checkbox"/> Desktop Video Conferencing | |
| <input type="checkbox"/> 73. <input type="checkbox"/> Imaging | |
| <input type="checkbox"/> 74. <input type="checkbox"/> Suites/Server Suites (Back Office, etc.) | |
| <input type="checkbox"/> 75. <input type="checkbox"/> Middleware | |
| <input type="checkbox"/> 76. <input type="checkbox"/> Document Management | |
| <input type="checkbox"/> 77. <input type="checkbox"/> Site Metering Tools | |
| <input type="checkbox"/> 78. <input type="checkbox"/> Computer Telephony Integration (CTI) | |
| <input type="checkbox"/> 79. <input type="checkbox"/> Data Warehousing | |

WIDE-AREA NETWORK EQUIPMENT & SERVICES

- | | |
|------------------------------------------------------------------------------------------------|---|
| A | B |
| <input type="checkbox"/> 80. <input type="checkbox"/> Modems | |
| <input type="checkbox"/> 81. <input type="checkbox"/> Asynchronous Transfer Mode (ATM) | |
| <input type="checkbox"/> 82. <input type="checkbox"/> Frame Relay Equipment/Services | |
| <input type="checkbox"/> 83. <input type="checkbox"/> ISDN Equipment & Services | |
| <input type="checkbox"/> 84. <input type="checkbox"/> FT-1/T-1/T-3 Multiplexers/Services | |
| <input type="checkbox"/> 85. <input type="checkbox"/> DSL Services/Products | |
| <input type="checkbox"/> 86. <input type="checkbox"/> SONET | |
| <input type="checkbox"/> 87. <input type="checkbox"/> Inverse Multiplexers | |
| <input type="checkbox"/> 88. <input type="checkbox"/> SMDs | |
| <input type="checkbox"/> 89. <input type="checkbox"/> Diagnostic/Test Equipment | |
| <input type="checkbox"/> 90. <input type="checkbox"/> DSU/CSU | |
| <input type="checkbox"/> 91. <input type="checkbox"/> VSAT/Satellite | |
| <input type="checkbox"/> 92. <input type="checkbox"/> PBXs | |
| <input type="checkbox"/> 93. <input type="checkbox"/> Voice Mail/Response | |
| <input type="checkbox"/> 94. <input type="checkbox"/> Videoconferencing | |
| <input type="checkbox"/> 95. <input type="checkbox"/> Leased Lines | |
| <input type="checkbox"/> 96. <input type="checkbox"/> Switched Data | |
| <input type="checkbox"/> 97. <input type="checkbox"/> Virtual Networks | |
| <input type="checkbox"/> 98. <input type="checkbox"/> Outsourcing/Systems Integration Services | |
| <input type="checkbox"/> 99. <input type="checkbox"/> Education/Training Services | |
| <input type="checkbox"/> 00. <input type="checkbox"/> None of the above (1 - 99) | |

9

Please indicate the platforms that are currently installed/planned:

(Check ALL that apply)

A. Currently installed

B. Planned for purchase

NETWORK PROTOCOLS

- | | |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| A | B |
| <input type="checkbox"/> 01. <input type="checkbox"/> TCP/IP | <input type="checkbox"/> 25. <input type="checkbox"/> Windows NT |
| <input type="checkbox"/> 02. <input type="checkbox"/> IPv6 | <input type="checkbox"/> 26. <input type="checkbox"/> Windows NT/Advanced Server |
| <input type="checkbox"/> 03. <input type="checkbox"/> SNA | <input type="checkbox"/> 27. <input type="checkbox"/> Novell IntranetWare |
| <input type="checkbox"/> 04. <input type="checkbox"/> DECnet | <input type="checkbox"/> 28. <input type="checkbox"/> Novell (NetWare 4.X) |
| <input type="checkbox"/> 05. <input type="checkbox"/> Novell IPX/SPX | <input type="checkbox"/> 29. <input type="checkbox"/> Novell (NetWare 2.X, 3.X) |
| <input type="checkbox"/> 06. <input type="checkbox"/> APPC/APPN/LU 6.2 | <input type="checkbox"/> 30. <input type="checkbox"/> Microsoft (LAN Manager) |
| <input type="checkbox"/> 07. <input type="checkbox"/> NETBIOS | <input type="checkbox"/> 31. <input type="checkbox"/> LocalTalk (AppleTalk) |
| <input type="checkbox"/> 08. <input type="checkbox"/> AppleTalk | <input type="checkbox"/> 32. <input type="checkbox"/> Banyan (VINES) |
| <input type="checkbox"/> 09. <input type="checkbox"/> NFS | <input type="checkbox"/> 33. <input type="checkbox"/> IBM (LAN Server) |
| <input type="checkbox"/> 10. <input type="checkbox"/> Other (please specify) _____ | <input type="checkbox"/> 34. <input type="checkbox"/> Artisoft (LANtastic) |

LAN ENVIRONMENT

- | | |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| A | B |
| <input type="checkbox"/> 11. <input type="checkbox"/> Gigabit Ethernet | <input type="checkbox"/> 35. <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> 12. <input type="checkbox"/> Switched Ethernet | |
| <input type="checkbox"/> 13. <input type="checkbox"/> Fast Ethernet (100 Megabit Ethernet) | |
| <input type="checkbox"/> 14. <input type="checkbox"/> Ethernet | |
| <input type="checkbox"/> 15. <input type="checkbox"/> ATM | |
| <input type="checkbox"/> 16. <input type="checkbox"/> Token Ring/Token Ring Switching | |
| <input type="checkbox"/> 17. <input type="checkbox"/> IP Switching | |
| <input type="checkbox"/> 18. <input type="checkbox"/> FDDI | |
| <input type="checkbox"/> 19. <input type="checkbox"/> 100Base-T | |
| <input type="checkbox"/> 20. <input type="checkbox"/> 10Base-T | |
| <input type="checkbox"/> 21. <input type="checkbox"/> LocalTalk | |
| <input type="checkbox"/> 22. <input type="checkbox"/> Fibre Channel | |
| <input type="checkbox"/> 23. <input type="checkbox"/> 100vg Any LAN | |
| <input type="checkbox"/> 24. <input type="checkbox"/> Other (please specify) _____ | |

NETWORK OPERATING SYSTEM

- | | |
|----------------------------------------------------------------------------------|---|
| A | B |
| <input type="checkbox"/> 25. <input type="checkbox"/> Windows NT | |
| <input type="checkbox"/> 26. <input type="checkbox"/> Windows NT/Advanced Server | |
| <input type="checkbox"/> 27. <input type="checkbox"/> Novell IntranetWare | |
| <input type="checkbox"/> 28. <input type="checkbox"/> Novell (NetWare 4.X) | |
| <input type="checkbox"/> 29. <input type="checkbox"/> Novell (NetWare 2.X, 3.X) | |
| <input type="checkbox"/> 30. <input type="checkbox"/> Microsoft (LAN Manager) | |

Please indicate the names and job functions of other individuals at your location to whom you would like us to send a copy of **NetworkWorld**.

Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____

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Briefs

■ **Ascend Communications, Inc.**, has teamed with Security Dynamics Technologies, Inc. to offer *Encrypted VPN Starter Kit*, a hardware/software package that lets users **tunnel securely through the Internet**. The package includes an Ascend Pipeline 220 access router; fire-



Ascend's Encrypted VPN Starter Kit

wall and encryption software; 25 copies of a Windows 95/Windows NT client that supports a firewall and encryption; and 25 SecureID tokens that generate random passwords. The package requires Secure Sockets Layer-capable browsers to work. *Encrypted VPN Starter Kit* costs \$12,000.

© Ascend: (800) 272-3634

■ **At NetWorld + Interop 97**, WRQ, Inc. will announce *Reflection PC-to-host connectivity* products that will support ActiveX. Users of the new *Reflection* package will be able to make Web connections from Windows 95 and NT desktops to IBM mainframe, AS/400, Hewlett-Packard Co., Unix and Digital Equipment Corp. hosts. WRQ adds Active Document support, which is part of Microsoft Corp.'s ActiveX specifications. With Active Document, users can incorporate Reflection in their browsers. The product ships in the fall. Prices start at \$199.

© WRQ: (800) 872-2829

■ **Midnight Networks** announced a new release of its *Avalanche/LW multiprotocol testing tool* for network systems and devices.

Release 1.5 of *Avalanche/LW* includes support for the Open Shortest Path First routing protocol, 100M bit/sec Ethernet, FDDI and the V.35 synchronous point-to-point protocol. *Avalanche/LW* costs \$24,995 and is available now.

© Midnight Networks: (888) 809-8378

Mariposa invents translation switching

Start-up nips away at the cost of T-1-speed ATM voice and data networking.

By Tim Greene
Petaluma, Calif.

Mariposa Technologies, Inc. has been around less than a year, but at NetWorld + Interop 97 next month it will announce big plans to bring down the cost of running private ATM networks.

By supporting switched virtual circuits (SVC) and inverse multiplexing T-1 ATM lines and compressing voice and data in a single box, the WAN access start-up hopes to attack the high price of ATM networking.

With the introduction of its first product, ATM Turbo eXchange inverse ATM multiplexer, Mariposa hopes to lure users looking for a cost-saving alternative to traditional networks.

The ATX 800 connects local Ethernet LANs and PBXs to wide-area T-1 ATM services. Users can reap savings by merging their private voice networks

into their WAN data networks, the company said.

In addition, compression for voice and data reduces the bandwidth needed, and support for SVCs allows more efficient use of the bandwidth.

The box also supports variable bit rate (VBR) voice, which requires less sustained bandwidth than constant bit rate (CBR) voice. This allows more traffic to be squeezed onto WAN trunks.

NETWORK+INTEROP 97

The company described the device as a performing translation switching that, for example, encapsulates PBX switching protocols into ATM cells for transport over the ATM WAN to a remote PBX. The ATX 800 also can set up and tear down 1,000 SVCs per second to carry the traffic.

Translation switching is unique in that the device does not try to generate voice signaling over the ATM network, according to Jennifer Pigg, vice president of data communica-

Mariposa switches ATM

The ATX 800 from Mariposa Technologies:

- Translates signaling protocols and switches them over ATM networks
- Inverse multiplexes up to six T-1 ATM lines
- Supports constant and variable bit rate voice
- Will be available Q1 1998
- Costs \$10,000

RUN promises faster TCP/IP

Company says its TCP device quadruples net performance.

By Marc Songini
Mahway, N.J.

It seems as if networks are never fast enough, providing a ready market for speedier and pricey routers and switches.

RUN, Inc. claims it can quadruple the performance of a TCP/IP net without upgrading core network components. Just add its new runTCP device, and you're in business.

RunTCP is part of a new class of products, dubbed transporters, that operate at Layer 4 of the Open Systems Interconnection model, the transport layer. Layer 4 switching uses TCP/IP session information in HTTP or IP's File Transfer Protocol to make intelligent switching decisions.

The hardware/software combination box can sit between a LAN and a server or a router and

a LAN. The product also can be used to segment a WAN.

Standard TCP/IP continually searches the net for the best path by sending data packets at ever increasing speeds. Using a set of proprietary algorithms, runTCP senses data transmission speed on the network and responds accordingly. The box determines the optimum speed available by measuring the return acknowledgment of its data packets.

As bandwidth grows or shrinks, runTCP will respond by speeding up or throttling back traffic.

The company said its product is ideal for highly loaded WANs and high-traffic Internet servers.

One analyst said the product should be of interest to small or midsize companies looking for a plug-and-play device to help

them manage their WANs.

Richard Villars, an analyst with International Data Corp., a market research firm based in Framingham, Mass., said RUN is one of a number of vendors looking to help users make TCP/IP run better. Whereas some vendors make complicated products that require a lot of fine-tuning, runTCP is a simple device that requires little effort to install.

Product pluses

According to Villars, the device works "to help people optimize network paths" with load-balancing, buffering and other data management techniques.

He said WAN-Internet access is expensive, and this device can reduce cost — for the right network.

"This solution is for medium-sized companies," Villars said. "It's not for Boeing."

The product, expected out by year-end, will start at about \$4,000.

RUN is part of Tel Aviv-based RAD Group, Inc.

© RUN: (800) 478-6929

tions for The Yankee Group in Boston. Rather, the device sends along the PBX signaling encapsulated in ATM.

Pigg said the box would compete with Northern Telecom, Inc.'s Passport 30 switch, a \$15,000 ATM box customized to handle VBR voice (NW, May 5, page 10).

The hardware platform was designed to support the throughput of a 155M bit/sec OC-3, so it has ample processing power to handle the relatively low 9M bit/sec bandwidth of six T-1s, the company said. The chassis is based on Intel Corp.'s Pentium processors and a PCI bus architecture.

Voice compression is 8-to-1 including silence suppression, and average overall voice and data compression is 4-to-1, the company said.

The chassis supports as many as six T-1 WAN interfaces, up to four T-1 VBR voice ports for PBX connections, two CBR voice ports, a 10/100 Ethernet port and a high-speed serial interface port.

In a sample network pricing example, Mariposa said that for a five-node network, replacing phone trunks with ATM trunks and installing ATX 800s, a user could save \$60,000 per month in line costs. In addition, it would reduce the need for one PBX in that model, which would pay for the five ATX 800s that would be needed.

The company was formed in February, and Stefan Mazur, formerly of General DataComm, Inc., is its CEO. The company includes among its 20 employees a core engineering group that worked for Nortel and is funded by private European investors.

Among its accomplishments, the engineering team claims credit for implementing voice switching in Nortel core switches and for building Nortel's voice-over-IP gear.

Drawing on that experience, the company also has incorporated in the ATX 800 prioritization of IP voice traffic as it crosses the ATM WAN to limit delay that could adversely affect voice quality.

ATX 800 goes into beta testing in November and ships in the first quarter of next year.

© Mariposa: (707) 766-9463

Vendors tackle application management

By Jim Duffy

Three network management vendors have applications in mind in this round of product releases.

Firewall aficionado Check Point Software Technologies, Inc. and start-up Aponet, Inc. have their sights set on managing application traffic. Meanwhile, Israel's Milestone Software & Systems, Ltd. is looking to crack the U.S. market with a tool that fosters application portability across multiple management platforms.

Check Point this week will unveil Floodgate-1, software that lets users define policies by which they can optimize application performance by controlling network bandwidth and alleviating net congestion.

Floodgate-1 runs on Solaris, Windows 95 and NT clients, as well as Solaris servers. Users define policies at the client workstation for establishing and allocating priority bandwidth to certain applications. The policies are enforced by Floodgate software "modules"

residing on Check Point firewalls. The modules establish bandwidth queuing sequences based on application priority.

Floodgate-1 client software for Windows 95 and NT will be available in the fourth quarter. Floodgate-1 for Solaris and other Unix versions will be available in the first quarter of 1998. Pricing ranges from \$4,995 to \$18,900.

Aponet's application management technique also is based on bandwidth monitoring. Its Bandwidth Policy Monitor product line allows users to monitor Internet and intranet usage patterns by

user, department or application.

Bandwidth Policy Monitor is comprised of a hardware probe and reporting software. The probe monitors how much 10M bit/sec and 100M bit/sec bandwidth specific IP addresses or TCP-based applications use. The software delivers the data in real time and provides historical usage pattern reports on a Web browser.

With these reports, users can charge back departments for bandwidth usage, plan equipment purchases and identify application-related problems, Aponet said. Bandwidth Policy Monitor for 10M bit/sec Ethernet LANs is shipping now and costs \$800. The 100M bit/sec model will ship in the fourth quarter.

Milestone is not managing applications per se but is attempting to resolve portability issues associated with management applications. The company's GeNMS Application Builder 4GL software tool kit enables users to develop network management applications that can run under any management platform, operating system and graphical user interface (GUI).

GeNMS Application Builder is de-

There's more online:

- A look at Cabletron's Integration of an application manager with its Spectrum console
- A paper on the problems of managing distributed applications



Policy Name	Source	Destination	Service	Control	Initial On
Outbound Web	Any	Web_Server	Web	Weight	AS
Outbound Web	Local_Host	Any	Web	Weight	AS
PrintCast	Any	Local_Print	PrintCast	Weight	AS
Video Conference	Remote_Office	Management_Group	Video Conferencing	Weight	AS
Sales VP Exception	Sales_VP	Client_Server	Any	Weight	AS
Field Sales	Field_Sales	Client_Server	Any	Weight	AS
Default				Weight	AS

Floodgate-1 lets users establish policies for bandwidth allocation.

signed to alleviate the need to develop multiple applications for different management platforms. Users only need to specify the uniqueness of the network device using a GUI-based configuration procedure. The rest of the work is done by the Application Builder, which functions as a "translator" between different management platforms, GUIs and operating systems, said Greg Snipper, Milestone's director of marketing and sales.

GeNMS Application Builder costs \$5,000 for Windows platforms and \$10,000 for Unix. It will be available in the U.S. in the fourth quarter.

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High-speed Routing

Torrent debuts with gigabit router for the enterprise

IP9000 features QoS for native IP, "wire-speed" table searches.

By Jim Duffy

Landover, Md.

This is not your Internet service provider's gigabit router.

While Cisco Systems, Inc. and others are aiming next-generation gigabit routers at the core of the Internet, start-up Torrent Networking Technologies this week will unveil its long-awaited gigabit router for the enterprise (NW, June 30, page 1).

Torrent's IP9000 Gigabit Router is designed to enable users of Cisco's 7500 Router and Bay Networks, Inc.'s Backbone Concentrator Node (BCN) router to migrate to gigabit speeds and utilize native IP for priority queuing and quality of service (QoS). Cisco, Bay and other vendors propose adding extraneous "labels" or "tags" to IP packets to scale performance and add QoS.

The IP9000 achieves these QoS heights with a feature called Per-Flow Service Provisioning.

This technology matches incoming packets to data flows without using proprietary protocols, such as Ipsilon Networks, Inc.'s Ipsilon Flow Management Protocol, Torrent said.

At your flow service

Features of Torrent's per-flow queuing:

- On-the-fly packet-to-flow classification using IP header
- Priority and throughput defined for each identified flow
- Eliminates contention in the switch fabric
- Per-flow traffic policing and usage statistics

Per-Flow Service Provisioning enables service profiles to be applied to traffic flows so high-priority applications can be guaranteed minimum bandwidth. Critical data flows are identified and assigned guaranteed minimum bandwidth and priority service, a feature usually found only in ATM switches.

Other applications are delegated bandwidth on a best-effort basis, which is how conventional routers handle all traffic. This is unsuitable for video and voice applications, said Gordon Saussy, Torrent vice president of marketing.

The IP9000 also features a patent-pending route search algorithm that enables the router to achieve a forwarding performance of 20 million packet/sec and latencies less than 25 microsec. This performance can be delivered for unicast, multicast and bandwidth-reserved flows, Saussy said.

The algorithm essentially bypasses the caching stage of matching network addresses to routes, Saussy said. Instead, hardware in the IP9000 performs a fast, wire-speed lookup in the full routing table.

The IP9000's routing table can hold more than 200,000 unicast prefixes and 64,000 multicast groups, Saussy said.

Find out more about Torrent:

- Look up white papers on high-speed routing technologies.
- See what other vendors are doing in the high-speed routing arena.

NetworkWorld



It can interoperate with Cisco 7500s and Bay BCNs through standard routing protocols, such as Routing Information Protocol 2, Open Shortest Path First, Border Gateway Protocol 4 and Distance Vector Multicast Routing Protocol.

The IP9000 is available in eight- and 16-slot chassis featuring 10G bit/sec and 20G bit/sec switching fabrics, respectively.

Each chassis can hold eight-port Fast Ethernet, one-port Gigabit Ethernet and four-port OC-3 ATM modules.

The eight-slot router with 64 10M/100M bit/sec ports costs \$55,000.

It will be available in the fourth quarter.

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Carriers & ISPs

Covering: The Internet • Interexchange and Local Carriers •
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Briefs

■ **BellSouth** last week announced it is offering fractional T-1 frame relay access to the Internet in 27 cities in its nine-state territory.

Prices range from \$344 per month for a three-year, 64K bit/sec connection with a committed information rate (CIR) of zero to \$3,682 per month for a one-year, full T-1 with a CIR of the full T-1.

Bandwidth is available in increments of 64K bit/sec. Until the end of the year, discounts on installation are available, depending on the service ordered and the length of the contract.

■ **SBC Communications, Inc.** announced it is offering Web hosting services through the Internet divisions of its Southwestern Bell (SWB) and Pacific Bell subsidiaries. Users have a choice of Unix or Windows NT-based Web servers.

SBC's Web server farm is based in Dallas and has redundant DS-3, 45M bit/sec connections to the Internet. The service is available in dedicated and shared-server environments. The services are available now for \$125 to \$170 per month.

© SWB: (888) 792-0999;

© Pac Bell: (800) 708-4638

■ **AT&T** announced it will move its entire IT operations organization to its outsourcing division, **AT&T Solutions**. AT&T said the move will help it achieve its goal of cutting \$2.6 billion a year in internal costs as well as demonstrate AT&T Solutions' ability to handle mammoth projects.

For its parent, AT&T Solutions will manage 2,300 Unix servers, 120,000 desktop PCs and 200,000 PBX and key-system ports.

Much of the company's software development work — notably, work on integrated billing platforms — will remain at the parent company under the direction of Executive Vice President Frank Ianna.

Ascend demystifies carrier activities

By Tim Greene
Alameda, Calif.

The performance of your frame relay network need no longer be a mystery.

Ascend Communications, Inc., in conjunction with other vendors, recently announced a software package that supports a view into what your carrier is offering.

NavisXtend software pulls statistics from Ascend carrier switches, organizes the data and makes it accessible through any SNMP-based management platform or a Web browser.

Carriers can grant customers access to the information so they can monitor their service-level agreements.

For example, Intermedia Communications Group, a Tampa, Fla.-based frame relay provider, is using Ascend's new

NavisXtend server software to provide baseline information supporting its ViewSpan service.

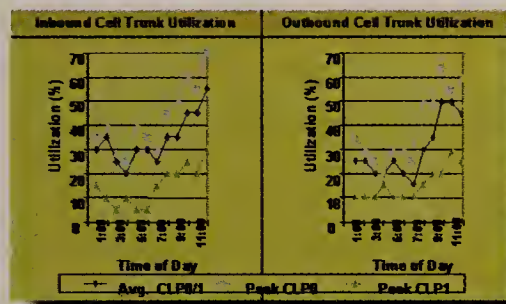
With ViewSpan, Intermedia customers can access network performance data on demand, including line status, perma-

Intermedia itself, said Marty Smith, the company's director of product engineering.

Intermedia is signing up other service providers to extend the view into their networks so customers with networks that span different carrier networks can get an end-to-end picture.

Users are pushing for tools that let them peek inside the carrier network. For example, Bill Meisner, network manager at *The Boston Globe*, said he would like to get a ViewSpan-type service from his provider, Bell Atlantic Corp., but it is not expected until next year.

In the meantime, Meisner said he is developing software to compile router data that will give him some idea of network status,



nent virtual circuit performance, number of frames passing a point and a database of provisioned services.

Intermedia has built on NavisXtend's Statistics server with software developed by

PBX spin off takes IP plunge

By David Rohde
Dallas

Selsius Systems, Inc. claims you can grab the potential savings of IP telephony and still have fancy phone sets, the most popular PBX features and scalability, too. The start-up last week unveiled a call processing system that transports intraoffice voice over an Ethernet LAN and wide-area voice over the public switched telephone network or a managed IP network.

Analysts lauded Selsius, founded in July as a spin off of high-end PBX maker Intecom, Inc., for devising a PBX replacement system that does not require IP telephony software to be loaded on each client PC. Instead, Selsius provides a proprietary digital phone set linked directly to the Ethernet LAN.

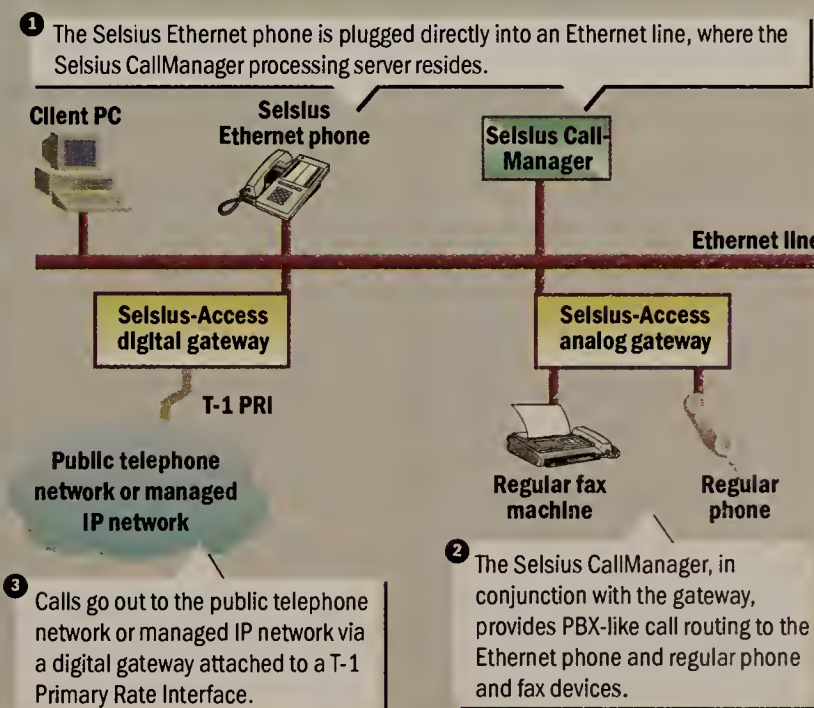
Existing analog devices such as phones and fax machines also are linked to the Ethernet network via a gateway device known as Selsius-Access. All the desktop devices then take call processing instructions — including common PBX and key-system features such as hold, conference and transfer — from the Selsius CallManager software running on a Windows NT server (see graphic).

"The users don't have to worry about learning IP telephony software," said Dusty Sykes, a staff consultant at Vanguard Communications Corp., a Morris Plains, N.J., research firm specializing in telephony issues.

Also key, Sykes said, is a larger gateway device that transmits voice signals to the public switched network via a T-1 ISDN Primary Rate Interface. This device supports four Digital Signal Processing (DSP) T-1 cards. Because each DSP card provides 24 ports, a single system can support up to 96 trunks to the wide area, said Selsius President David Tucker.

Still, Selsius initially

IP TELEPHONY INTEGRATED WITH CURRENT DEVICES



will target smaller offices, particularly managed IP enterprise network branch locations looking to avoid the setup and management of separate LAN and PBX infrastructures.

The Selsius system is compliant with the H.323 standard for multimedia communications over the Internet. The compliance lets more sophisticated users launch a data collaboration session to another H.323 client,

use and troubles.

Other frame relay switch providers, notably Cisco Systems, Inc., lack such tools, said Craig Johnson, an analyst at Current Analysis, Inc., a consultancy in Ashburn, Va. He predicted Cisco soon would announce its own switch management package.

While Intermedia developed its own applications, Ascend's NavisXtend will be available to any network supported by Ascend switches. NavisXtend consists of six server applications that enable enhanced network management, provisioning and accounting capabilities. For example, NavisXtend Fault Server supports access to alarm information by Java-enabled browsers. That information could be shared with end users if the carrier wanted.

NavisXtend applications are available immediately and cost between \$7,500 and \$15,000.

© Ascend: (800) 272-3634

Get more info online:

- A look at Microsoft's latest version of the Telephony API
- A catalog of IP telephony hardware and software vendors
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WAN MONITOR

Loop competition? What loop competition?

Getting many of the regional Bell operating companies to cooperate on unbundling the loop is like getting a 2 year old to bed at night: It's not totally impossible, but it takes a varied combination of persistence, cajoling and threatening. And it takes much longer than it should.

It's no secret that, despite regulatory edicts to the contrary, there are few areas of the country offering much competition for that last mile of copper connectivity.

The experiences of ioNet, an Internet service provider operating primarily in Southwestern Bell's territory, is just one of many examples. Other ISPs are trying to secure dry copper wire for digital subscriber line

(DSL)- based Internet connectivity. Like them, ioNet is finding it necessary to go through the time-consuming and costly process of filing for competitive local exchange carrier (CLEC) status as a prelude to securing access to the access.

A would-be CLEC has to endure six to eight months of red tape in each access area just to gain a slightly better position for fighting the bloated bureaucracies we call RBOCs. Yes, this sounds

harsh, and there are a few areas of the country where securing copper is slightly less laborious.

There are, however, no RBOCs that are willowy and nimble, so the bloated comment stands. In the best cases, it's a pain in the butt to wade through all the bureaucracy and unresponsiveness of the RBOC in question. In the worst cases, it's an out-and-out battle against a Goliath hellbent on keeping a would-be competitor from gaining a meaningful toehold in the market.

From little David's point of view, things only marginally have improved in the past year — despite several hundred million spent by RBOCs to "facilitate competition." These days, at least newcomers filing for CLEC status can leverage any established interconnection agreements that had been reached earlier by a pioneer.

For example, Network Access Systems is a competitive access provider operating in the Washington, DC area. It focuses on providing wholesale DSL-based, high-speed access to large businesses, carriers and ISPs. While the conditions have improved in the last year, NAS still fights an uphill battle in most areas for dry copper access lines. According to NAS, Bell

Atlantic is not so bad to work with. Yes, they are bureaucratic, but at least they aren't downright malicious.

The more CLEC agreements that are

filed the easier it is to file another. WorldCom's access arm, formerly MFS, has paved the way for providers in many areas. There are selective pockets of improve-

ments, including some of GTE's California territories, but by and large it's still a battle.

Briere is president and Heckart is vice president with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.



Daniel Briere and Christine Heckart



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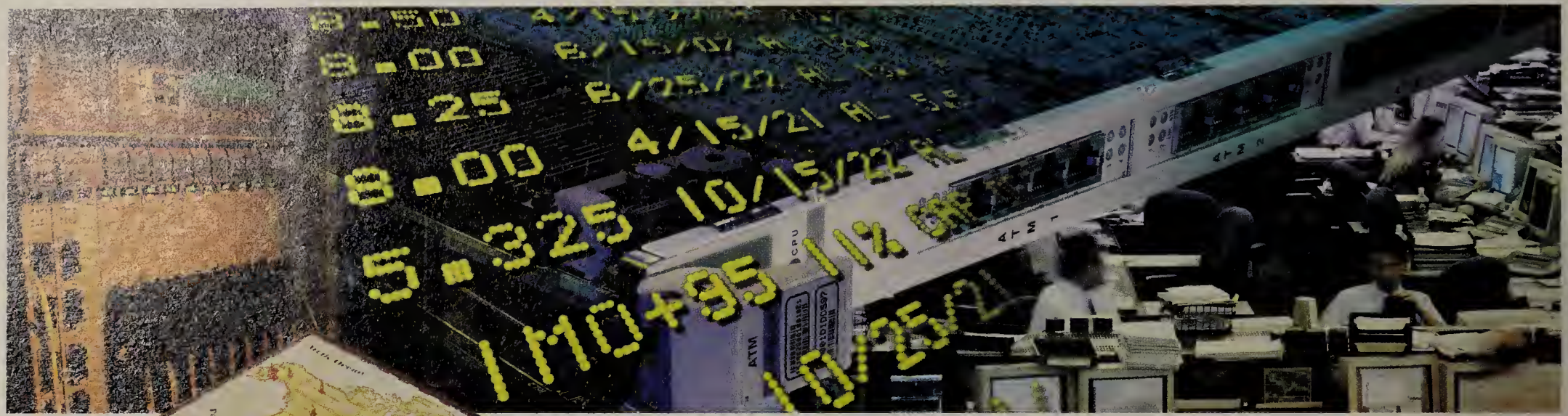
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Briefs

■ **Caravelle, Inc.** last week reintroduced its Webwatcher software, which has been rewritten in Java and features new capabilities. The company's **Webwatcher 5.0** Java edition sup-



plants all other versions of Caravelle's tool for monitoring corporate Web sites, said Lynda Partner, president and CEO of the Nepean, Ontario, company. Typically, Caravelle's customers use Webwatcher to monitor their Web servers, routers and Domain Name Servers, Partner said. Among Version 5.0's new features is enhanced notification options.

Webwatcher 5.0 is in beta and will be available next month for \$295.

© Caravelle: (613) 225-1172

■ **Open Sesame**, a division of Charles River Analytics, Inc., last week began shipping Learn Sesame, software that developers can add to their Web servers to create dynamic personal profiles of Web site visitors based on their behavior while visiting the site. Learn Sesame starts at \$25,000 and is available for any Windows NT-based Web server using Active Server Pages, Java, C or C++.

© Open Sesame: (800) 913-3535

■ **The Vision Factory** is shipping **Cat@log 2.0**, a Web catalog product that includes a way to personalize online buying through customer profiling and data filtering. Using Version 2.0, which has an introductory price of \$4,995 through Oct. 31, developers also can connect to back-end databases from Informix Software, Inc., Microsoft Corp., Oracle Corp. and Sybase, Inc.

© The Vision Factory: (408) 461-2100

Exchange tops Notes, GroupWise in survey

By Paul McNamara
Palo Alto, Calif.

Microsoft Exchange customers are happier than Lotus Notes and Novell GroupWise users.

That's the case according to a messaging and collaboration product survey of 124 IT shops, conducted by Creative Networks, Inc., a Palo Alto, Calif., research firm. In the survey, which divided results into eight categories, users ranked Exchange first or tied for first in all but one area.

While reported levels of satisfaction for all three products were relatively high and similar across several key categories, Notes lagged noticeably in areas recognized as its trouble spots: ease of use, service and support.

The high grades for Exchange show that Microsoft Corp. has delivered on what it promised when the product was launched in the spring of 1996, according to the survey's author.

"Microsoft really focused on developing a messaging system

that is pretty easy to install and deploy," said Nina Burns, president of Creative Networks. "That's what people are experiencing."

Growing pains may yet emerge, Burns added, as those surveyed had an average of only eight months experience with Exchange.

"We don't know what is going to happen after [Exchange usage] expands," she said.

Battles brewing

As might be expected, Rob Shurtleff, lead product manager for Exchange, said he was heartened by its across-the-board strength in this survey. He saw the results as a harbinger of market battles to come.

"The product is now moving downstream from the big companies that looked at it for a long time into a much broader reach of medium companies," Shurtleff said. "That's going to be the next battleground."

A Lotus Development Corp.

HOW CUSTOMERS GRADE EXCHANGE, NOTES AND GROUPWISE

Creative Networks, of Palo Alto, Calif., conducted a survey of 124 organizations. It based scoring from 1 to 5, 1 being highly dissatisfied and 5 being highly satisfied.

Category	Highest score	Second place	Lowest score
Initial configuration and migration	Exchange (3.4)	GroupWise (3.3)	Notes (3.2)
Day-to-day operations	Exchange (3.8)	GroupWise (3.7)	Notes (3.5)
Key system attributes	Exchange (3.8)	Notes (3.6)	GroupWise (3.5)
Performance	GroupWise and Exchange (4.0)	Notes (3.9)	
Overall system attributes	Notes and Exchange (3.9)	GroupWise (3.8)	
Key vendor attributes	GroupWise (3.6)	Notes and Exchange (3.5)	
Technical support	GroupWise and Exchange (3.7)	Notes (3.1)	
Service and support	Exchange (3.8)	GroupWise (3.7)	Notes (3.4)

official, while citing no fault with the survey's methodology, suggested the results fail to reflect the fact that Notes is designed to do more than its competitors or that its wider deployment invites closer scrutiny.

"Our average installation is

far larger than the average installation of Exchange particularly and has been there a lot longer," said Arthur Fontaine, Internet marketing manager at Lotus. "That lets [customers] experience a lot more warts."

Nevertheless, Fontaine was able to find bright spots in the survey.

"A couple of things we felt pretty good about were that we scored highest on security, reliability and quality," he added.

Improvements needed

Burns said the challenges for Lotus are clear.

"Lotus does need to take note and beef up their services and support environment, which they are already doing," she said. "Also, they need to make their mail and messaging systems in Notes simpler to deploy and manage."

As for Novell, Inc. and GroupWise, company officials were pleased to see their product come out on top in several key performance categories. They also argued that since most of the GroupWise customers surveyed were using Version 4.1, they had yet to be exposed to upgrades that have added platform support, Internet hooks and development tools.

"In light of that, we did well," said Ed McGarr, vice president of marketing for the Novell Applications Division. ■

The road ahead for Netscape

Andreessen on groupware, partnerships and acquisitions.



Second of two parts.

Netscape Communications Corp. has moved far beyond the Web browser market in three years to jump into the groupware, directory and net management markets, among others.

Marc Andreessen, Netscape's executive vice president of products, recently spoke with Network World News Director Bob Brown about Netscape's strategy and plans. Last week, part one of our interview focused on what makes Andreessen tick these days.

Why is Netscape — a company that burst onto the scene with a brand new technology in the Web browser — now focusing on established technology such as groupware and calendaring software?

What you would call estab-

lished we would say, for the most part, hasn't in fact been established. Networking is only now reaching the period of mass deployment, and the reason is because the standardization that allows mass deployment is only now starting to happen. So what we need to do is completely enable that standardized environment.

For example, you could do calendaring on an internal network before, but you could never do scheduling across companies.

Groupware is another classic example. It is only marginally interesting if you only use it within one company. But when it really starts getting interesting is when, for example, you want to design a product that pulls in people from your customer com-

munity, your suppliers and your distributors.

What markets does Netscape need to own to achieve your objectives?

We're taking a broad cut at networking. Within that, the three basic markets are intranet, extranet and the Internet.

You don't think that's a little broad?

No, because the technology is shared, right? The requirements on the intranet side, for example, are being fundamentally changed by what's happening with extranets and the Internet. It's getting to the point where people are look-

ing to build their internal networks in a way that they can automatically be extended out to their partners and customers.

Netscape has partnered with lots of companies, mostly soft-
See Andreessen, page 34



Netscape's CEO
Andreessen

Vendors fire up fast firewalls

By Ellen Messmer

Companies trying to forge high-speed links from their LANs to the Internet will welcome two new 100M bit/sec firewalls coming onto the market.

Radguard, Inc. and WatchGuard Technologies, Inc. this week will separately announce versions of their flagship firewalls that support 100M bit/sec Ethernet access, a quantum leap from the 10M bit/sec LAN speeds they boast at present.

Set to ship next month, Radguard's new Comprehensive Inter-networking Pro (cIPro) firewall will handle application-layer filtering of e-mail, Web pages and File Transfer Protocol documents at up to Fast Ethernet speed.

"The cIPro firewall is basically a LAN gateway," said Radguard President Ronen Kenan, who added that his firm also has a token-ring version of the firewall in the works.

Plugged into a router, the 100M bit/sec cIPro LAN gateway could support

wide-area connections ranging from frame relay to 155M bit/sec ATM.

The cIPro box starts at \$5,450 for 25 users, rising to \$15,000 for unlimited use.

Radguard plans to add encryption support to the cIPro firewall by year-end.

Also on the firewall fast track is WatchGuard Technologies (formerly named Seattle Software Labs, Inc.).

WatchGuard today will start shipping its Firebox 100, which supports Fast Ethernet connections. However, the wide-area connection through a router would be limited to 45M bit/sec (T-3 speed), acknowledged David Bond, WatchGuard's vice president of engineering.

While the box can be used to support a single 100M bit/sec link, it also can provide three 10M bit/sec interfaces, enabling net managers to cordon off different parts of an intranet. The firewall is priced at \$3,995.

© Radguard: (201) 236-2324; WatchGuard: (206) 521-8340



Firebox 100 supports three 10M bit/sec Ethernet links or a 100M bit/sec pipe.

Andreessen

Continued from page 33

ware vendors. Are there any plans to get together with any of the traditional network equipment vendors?

There's been sort of an arbitrary separation between the networking and software parts of the industry. For the customer that's meant that you could put in a network using off-the-shelf components and then buy whatever applications you want to run over the network, but the applications and the network never really talk to each other.

[Now] the sophistication of both the network and the applications is reaching the point where they need to start talking to each other.

So are you saying we should expect to see Netscape pair up with an internetwork company?

Absolutely, [though I can't say which]. Our approach is very much standards-based. The network should be able to talk to the applications using standards-based protocols and mechanisms like [the Lightweight Directory Access Protocol], and you should start to be able to share directories and do common authentica-

Get an expanded version of the entire interview online.



tion for access control. The standards have matured a lot over the last couple of years, and you may as well start taking advantage of that at multiple levels.

What do you think of Microsoft Corp. and Cisco Systems, Inc. partnering on directories?

I don't think it was smart for Cisco because if Microsoft is successful, it'll lead Cisco down a technological blind alley. The schedules I've seen from them range over the next two to four years, and it's safe to say a lot is going to happen in the meantime on the standards front.

What's Netscape's attitude toward making more acquisitions at this point?

Our general attitude toward acquisitions is we love doing them, and we've benefitted a lot from the ones we've done, so we'll undoubtedly do more. ■

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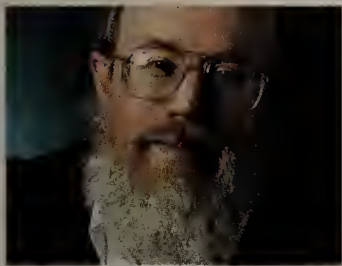
'NET INSIDER

Thinking outside of a box

ATM put lots of people in a box. Almost all of the pundits, big consulting firms and trade press writers spent the last few years saying that ATM was the inevitable future for all types of networks. Campus backbone networks, WANs and even LANs were going to be running over ATM any day now.

This widespread assumption has meant that a realistic evaluation of what technology should be used in each situation has been very hard to do in many environments. Corporate IT managers read the stories and became believers that

the best strategic direction to head in was toward a seamless ATM world. Any suggestion from the people actually running the network



Scott Bradner

in favor of some other technology for some part of the network was seen as diverting the path from the preordained future and could not be seriously considered.

For a number of reasons (many explored in previous editions of this column), ATM is no longer seen as quite so inevitable a total solution. This has made it possible for some network designers to start trying to figure out what the best technical solution might be for particular network problems. This is not yet true everywhere, but there are more people getting out of the confines of an assumed ATM future all the time.

And there are some interesting technologies worth considering. I'll use interconnecting network servers and storage systems as an example of a problem area.

Just because ATM may not be the answer to all problems does not mean that it might not be the answer to specific problems. High-performance ATM interfaces are now available for many servers and storage systems.

If LAN-like segmentation is desired — and it is by me — ATM systems can run the ATM Forum's LAN Emulation or Multi-Protocol over ATM, or the IETF's Classical IP over ATM.

But another option is Fiber Channel, a standards-based high-speed network technology that can support long-distance links and large packet sizes. Large packets are more efficient for bulk data transfer than the smallish 1518-byte maximum size on Ethernet.

Gigabit Ethernet also should be considered. This technology looks like it will be quite cost-effective for linking servers and storage systems, but support for large packet sizes is a nonstandard feature.

Another alternative I've seen is the extension of the disk-to-computer SCSI connection into switches and to use that

as the basis of a network to interconnect a server farm.

Finally, the somewhat silly talk about Fast Token Ring as a new basic networking

advance would not have happened without the change in attitude about ATM.

I'm not trying to list all of the options or to make any specific recommendations but to point out that once you free yourself from an assumed answer you can actually figure out what technology and design will do the job best. This may be a new experience for a lot of network

designers.

Disclaimer: Far be it from me to dissuade those who assume that Harvard is the answer, but the above observations are my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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outhwest Airlines has a spiffy Web site — www.iflyswa.com — that allows a 'Net-savvy traveler to select, book and pay for a flight online.

This Web site actually is pretty standard stuff these days. However, should customers simply wish to thank the airline for providing this convenience, they'll need to drop their mouse and grab a pen and paper: Southwest does not accept e-mail.

The airline is by no means alone: Chrysler Corp., for example, does not accept e-mail either. Although e-mail may be ubiquitous on worker desktops, the notion of providing generic Web site addresses — info@company.com, sales@company.com, etc. — frightens many who question whether their organizations can answer the resultant correspondence in a satisfactory manner.

The problem has captured the attention of more than a half-dozen vendors, mostly start-ups or relative unknowns. They are pushing software that will analyze, sort, route and generate automatic responses to high-volume e-mail that flows into generic, or so-called alias, e-mail Web sites.

The products range from \$200,000 enterprise systems employing artificial intelligence agents that infer meaning from message text to \$1,500 e-mail server add-ons that simply route messages into designated queues for pickup by humans.

No one questions the need for these products.

"There are many anecdotal stories where people just get flooded with e-mail," says Kevin Krone,

By Paul McNamara

director of marketing automation at Southwest in Dallas. "We don't have the infrastructure to handle that kind of volume."

Nor is Southwest sold on the solutions available today.

"We feel that the current slate of technology offerings out there isn't really robust enough to handle it," Krone says. "There are some fairly advanced ones that go through the e-mail and pick out certain words and infer a

context and send back an appropriate response. But if you guess wrong, you run the risk of alienating somebody."

One consumer electronics company, Bose Corp., recently surveyed 10 corporate IT departments to gather insight about its Web site e-mail.

"The majority of them had disastrous experiences," says Paul Olean, director of customer relationship development at Bose in Framingham, Mass. "The IT departments were embarrassed by it because they felt they were not giving good service to their customers."

Just recently, however, Bose cautiously dipped a toe into the Web site e-mail waters.

"We started selling products internationally last week and felt we couldn't do that without an e-mail address," Olean says. "For someone in another country, e-mail would be the preferred way of contacting us."

While not yet inundated with messages, once traffic volume dictates, Bose intends to use a product called Web Leader E-Mailroom from ErgoTech Technologies, Inc., of New York.

Message traffic volumes can vary widely, according to Mark Levitt, an analyst at market research firm International Data Corp., of Framingham, Mass., which recently conducted a survey on the subject.

"There were a couple of companies that claimed to get between 250 and 500 messages a day, but the average was more in the one to 25 range," Levitt says. "Over a week's time, that definitely adds up."

The volume is much higher — and the problem more pressing — at San Francisco-based Charles Schwab & Company, Inc., an online brokerage that averages 8,000 to 10,000 messages a week to its Web site.

"Given our business — we have over 900,000 online accounts, with about \$67 billion under management — we have to deal with it," says Mary Kelley, vice president of database and relationship marketing.

Schwab is using Select Response from Aptex Software Inc., of San Diego, to help sort the load, although the company has yet to deploy the automated response capabilities it provides.

"One of the big things with agent technologies is trust," Kelley says. "It takes a while for everybody to get a sense of confidence. We're kind of in that phase [with Select Response], but we're very hopeful that it will allow us to increase productivity."

Schwab plans to eventually issue automated responses to frequently asked questions (FAQ), which vendors see as a natural application.

ARE THEIR OWN HOUSES IN ORDER?

Six companies peddling software to handle high-volume Web site e-mail were sent a simple request for information. Here's how they did:

Company	E-mail address	Response time	Quality of response
Aptex Software	info@aptex.com	57 minutes	Personalized and useful
Brightware	info@brightware.com	1 hour, 1 minute	Personalized and useful
Mustang Software	sales@mustang.com	1 hour, 7 minutes	Form acknowledgment; personalized reply 1 hour later
ErgoTech Technologies	ergomail@ergo-tech.com	1 hour, 23 minutes	Personalized and useful
Forte Software	info@adante.com	1 hour, 30 minutes	Personalized and useful
Millennium Cybernetics	info@interactive.com	18 hours, 30 minutes	Personalized and useful

"The best candidates for automated e-mail response are companies where they've already identified a number of FAQs, and the FAQs are a reasonable percentage of their e-mail volume — say something in the 15%-plus range," says John Gaffney, vice president of marketing at Aptex.

So far, the major e-mail vendors — Microsoft Corp., Lotus Development Corp., Novell, Inc. and Netscape Communications Corp. — have not addressed the Web e-mail overload problem in their server products in any significant way. But vendors already in the market expect the big boys to join them soon or come calling with licensing and merger overtures.

Among the companies already selling or developing these e-mail response products are: Millennium Cybernetics, Inc., of Cambridge, Mass.; Mustang Software, Inc., of Bakersfield, Calif.; and Kana.com of Palo Alto, Calif.

"With these tools, there is almost no excuse not to get some response [to the e-mail sender]," Levitt says. "Before the tools were here, the company could say, 'We can't do anything about it.' Now they really can't do that." ■

A black hole?

Some companies that accept generic Web site e-mail might be doing their customer service reputations more harm than good, according to industry experts.

"You'd be shocked at the companies that are considered a black hole when you send them a message," said one company executive who requested anonymity. "The most well known would be Netscape. When you send a message to them, it is very difficult to get a response."

Network World sent a message to moreinfo@netscape.com requesting information about browser comparisons. Two minutes later we received an automated acknowledgment, albeit a useless one.

Two days later we received a personalized response with pertinent information.

Not great, but not a black hole and certainly better than snail mail.

— Paul McNamara

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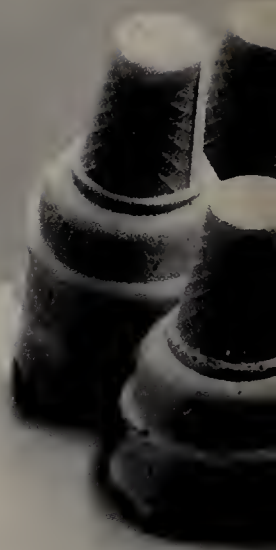
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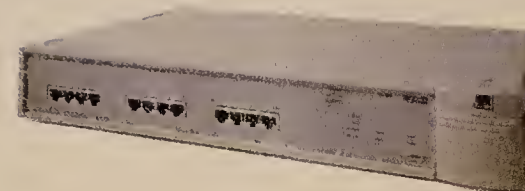
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IntraNet

September 1997
Volume 2, Number 9

FEATURES •

16 COVER: What's doing with Domino?

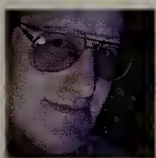
Not so long ago, Lotus Development Corp.'s "work the Web" slogan would have set people to laughing or crying, depending on their reliance on Notes. But the company's Domino is coming on strong now as a player in corporate intranets.

12 Growing Mozilla



Netscape Communications Corp. is growing up, its browser technology is maturing and Mozilla, its lizard-like mascot, is graying around the edges. In this Q&A, President and CEO Jim Barksdale talks about what the company has learned and how it's changed since 1995.

18 An intranet energized



Sandia National Labs is ready to power up its 3-year-old intranet to the next level by bringing Web-based workflow applications and the related ability to define roles and delegate authority online. The goal: conducting all internal business processes electronically.

22 Choice tools



What Web tools can't you live without? *IntraNet* recently asked that question of a few intranet developers, and here's what they told us about the products they've just got to have when working on their corporate Webs.

DEPARTMENTS •

Hot Links 5

Your virtual connection to newsbits, opinion, insight, humor and other marginalia from planet intranet.

IntraNet Handbook: FastCGI 6

The Common Gateway Interface (CGI) sure is popular for tying together back-end applications and Web servers, but it has its limitations. Enter FastCGI, a CGI extension on which developers are increasingly starting to rely.

Ask Dr. IntraNet 6

The doctor's in and answering reader questions about browser problems and disaster recovery.

Review: Digitivity's Cage 8

Here's a look at a product for companies thinking about

allowing Java applets on their intranets. Cage isolates client systems from Java applet code using a unique quarantine-like system. Our reviewer categorizes Cage as one of those rare must-have products.

Product Watch: Facing up to intranet security 10

Face-recognition products are some of the most exciting, effective and cost-efficient security offerings you can use to secure your Web.

IntraVert: Are you flying blind? 27

Ask a commercial airline pilot to fly a jumbo jet without instrumentation, and you'd get a big, fat "No." Columnist Mark Gibbs says intranet managers should have the same attitude when it comes to their Webs.

From the Editor

One recent Saturday morning, my kids were clamoring to watch some cartoons so I flipped on the TV. I figured a quick run through the channels would convince them another activity was better worth their time. Little did I know they'd be the ones needing to drag me away.

I knew most of the stations would be foregoing their children's lineup that day in order to cover Princess Diana's funeral. Watching a slow-moving hearse, no matter how flower-strewn, wouldn't catch their attention. And I'd had my fill of Diana's death, so that coverage didn't draw me in either.

But something did. As I was skimming through the channels, I heard the word "intranet." At first I thought I was just groggy, but no. The local PBS station was airing a documentary of sorts on Federal Express Corp. and its intranet. At least that's the brief portion of the show I saw before my attention was diverted.

I had listened long enough to hear the narrator explain the difference between external and internal Webs and a FedEx IT manager explain how the company puts its Web to use. Firewalls and security were next up on the agenda.

Even though I thought I'd put intranets behind me for a couple of days when I powered down my PC Friday afternoon, I found this to be pretty cool. In a brief moment of foolishness, I even tried engaging my 3 year old's interest.

Granted, 7 a.m. Saturday is not exactly a coveted programming slot, but I'd consider this another indication that intranets have definitely hit prime time.

— Beth Schultz, executive editor
(bschultz@nww.com)

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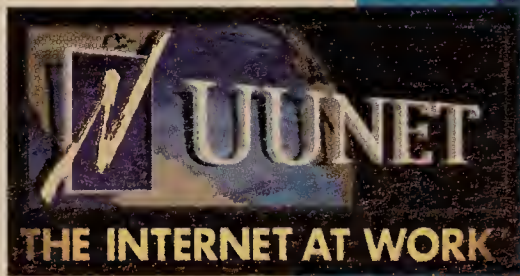
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Turning info into knowledge

Intranets can bring infogluts, but it's knowledge management that helps make it all useful. This is good information for the 28% of companies surveyed by Boston-based Delphi Consulting Group, Inc. that already have a knowledge management strategy in place.

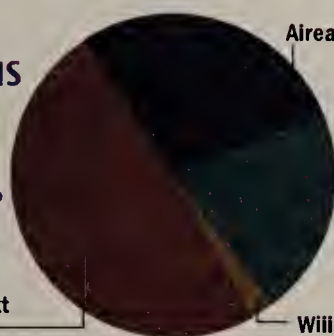
Another 77% of survey respondents expect to implement some sort of knowledge management solution within the next two years, according to Delphi, which queried 36 vendors and more than 650 evaluators and users of knowledge management solutions.

As defined by Delphi, knowledge management includes document management, search and retrieval, repositories, object technology, workflow and intranets. The report also says that intranets are often the organizing point for the other tasks.

Delphi is tackling the topic in a series of management education classes this fall and winter. This month it is releasing its 1997 Knowledge Management Insight Research Report. Information about both is available from the company or online at www.delphi-group.com.

WHEN WILL ORGANIZATIONS INVEST IN KNOWLEDGE MANAGEMENT?

Will have it within the next 1 to 4 years **49%**



Already have it **28%**

Will have it within the next year **21%**

Will never invest in it **2%**

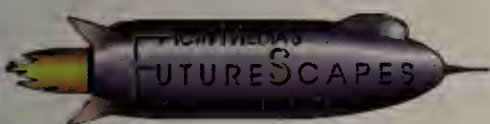
Quiz your users

Research firm is looking for internal Web surfers.

Poll your users and earn valuable prizes. That's the online survey tactic of ActivMedia, Inc., which is looking for partners in its Futurescapes study of life and work on the Web.

The Peterborough, N.H., market research firm (www.activmedia.com) invites intranet managers to post banners on internal home pages that feature a link to the Futurescapes survey. If users surf to the survey, they'll be asked to answer questions about their online preferences and the effects of digital communications at work and home.

Companies will receive a digest or detailed report of the study, depending on how many of their users participate. Companies with the most respondents will receive a pass to attend the ActivMedia conference, during which the firm will report its survey results.



The conference, called "Economic Earthquakes: Implications for Commerce and Government of Widespread Global Net Adoption," occurs Nov. 3 and 4 in Washington, D.C. It will cover many network and digital information management issues.

"The survey gives companies a chance to look at their own employees' usage and compare it with similar users," says Chris Wheeler, an ActivMedia representative.

On request, ActivMedia will provide comparisons of a participant company's demographics with other sections of the study.

Extranets to rule EC

Gartner Group predicts big migration to Web-based commerce.

Looks like a big boom for extranet-based electronic commerce is in the offing for the next five years. At least that's what market research firm Gartner Group, Inc. thinks.

Gartner, of Stamford, Conn., forecasts that by the year 2002, 40% of the businesses doing electronic commerce now will be doing so on extranets, in restricted-access, targeted audience operations. Often, transactions will be conducted on virtual private networks using Internet plumbing, Gartner analysts say.

What's more, Gartner predicts that 80% of the new electronic commerce business opportunities will be on extranets. It estimates a \$4 billion to \$5 billion business-to-business electronic commerce market now, and expects the market to hit \$8 billion by the year 2002.

Some of the particulars of that extranet-oriented electronic commerce are the highlights of Gartner's Intranet+Extranet Conference and Exposition, Sept. 23 to 25 in San Francisco. The lineup includes preconference tutorials, as well as intranet manager presentations and vendor exhibits. Information can be found at www.expocon.com.

Out and about

Here's a sampling of upcoming events that will feature intranet-related conferences or product exhibitions.

Date	Sept. 29-30	Oct. 7-10	Nov. 3-4	Nov. 5-7	Nov. 16-21
Event	ZONathon Fall '97	NetWorld+Interop 97	Economic Earthquakes	Push Technology for Corporate Applications	Intranet Implementation & Operations Conference
Location	San Jose, Calif.	Atlanta	Washington, D.C.	Chicago	Washington, D.C.
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FastCGI: Addressing the limitations of a popular Web interface

BY TOM PARKHURST

The Common Gateway Interface (CGI) has become a universally accepted standard for developing back-end Web server applications. Nonetheless, it has some significant limitations, including performance problems and lack of scalability.

So it's not surprising that developers have been looking for an alternative. And they just might find what they're looking for in a new CGI extension called FastCGI.

CGI was designed to provide the ability to extend Web server functionality in the most generic way possible. CGI applications run separately from the Web server software as programs that are invoked through a standard URL request in the same way that an HTML document is called. The CGI application communicates with the Web server through environment variables and the application's standard input and feeds its output back to the Web server through the application's standard output.

Because CGI applications run separately from the Web server application and have a simple, generic interface, Web developers have the freedom to develop their CGI programs using any language that supports standard file I/O. This separate development also helps make well-planned CGI applications portable between Web servers.

CGI basics

Each time a CGI program is requested, it must be loaded from disk and a new process started. Then, after the program has completed, the resources associated with the program must be released. This creates a hefty performance hit on high-volume servers.

Starting a new process for each request also eliminates the efficiencies of persistent data and processes. Information that is generated as a result of one request cannot be used in the next. For example, CGI's lack of persistent data makes it impossible for one data request to share a database connection with another.

A CGI program that retrieves information from a SQL database, for example, must allocate the database connection, log on to the database server, parse the SQL command, assign local names to database fields, execute the command, fetch the data, disconnect and free up memory. This entire process must be repeated for every request for information.

Many Web server vendors, including Netscape Communications Corp. and Microsoft Corp., have created APIs to work around the CGI performance problems. These APIs are integrated tightly with the Web server and provide the functionality of CGI programs with the addition of process and data persistence. Using an API, a database program could hold a database connection open so the next request does not carry the overhead of connecting and disconnecting.

Web server APIs provide powerful solutions, but they are proprietary. For the most part, this means applications are not portable between Web server APIs and rarely between platforms. Also, the majority of Web server applications are still written for CGI, so translation to an API-based application is not economically feasible.

FastCGI can help. Like CGI programs, FastCGI programs run separately from the Web server and are invoked through standard URLs. But like Web server API-based programs, FastCGI programs are persistent. When the program has completed a request, its process remains open while waiting for the next request. This changes the method the program uses to communicate with the Web server.

FastCGI details

A FastCGI-compliant Web server needs to be able to talk to a running application. To do this, the FastCGI interface wraps all of the standard I/O streams and the CGI environment variables into a bidirectional connection between the Web server and the FastCGI application.

When the FastCGI application is on the same machine as the Web server, this connection passes information back and forth through standard I/O streams. If the application is not on the same machine as the Web server, communication is handled through a TCP stream.

Most CGI programs are easily ported to FastCGI. A simple CGI program written in C would look something like this:

```
#include <stdio.h>
void main(void)
{
    printf("Content-type: text/html\r\n");
    printf("\r\n");
    printf("Hello Network World!\n");
    exit(0);
}
```

This program returns a "Hello Network World!" response to the client and then exits. It operates by simply writing the HTML text to standard output through the printf() function.

The same program migrated to FastCGI would look like this:

```
#include <fcgi_stdio.h>
void main(void)
{
    while( FCGI_Accept( ) >= 0 )
    {
        printf("Content-type: text/html\r\n");
        printf("\r\n");
        printf("Hello Network World!\n");
        exit(0);
    }
}
```

ASK DR. INTRANET

Please step in and lie down, Steve Blass is in for consultations. He understands the strains felt by people developing and managing intranets. Send your problems to dr.intranet@paranet.com.

When using Netscape Navigator to view Microsoft Word documents from our intranet NCSA-based Web server, all I get is binary gibberish. The browser correctly launches Word when loading Word files from the local disk and when viewing Word documents from Internet servers. What's wrong with my browser?

Via the Internet

I don't think anything is wrong with the browser. It sounds like you've got a configuration problem on your intranet server.

On NCSA servers the file `httpd.conf` establishes a number of configuration parameters, including the location of the `mime.types` file, which the server uses to associate file extensions with file content types. Make sure the path setting for `mime.types` is correctly set in `httpd.conf` and that the rest of the settings in the file match your installation.

Next, add an entry to the `mime.types` file to associate Word document files with Microsoft Word. You should associate `*.DOC` and `*.doc` files, since Unix file names are notoriously case sensitive.

While you're in `httpd.conf`, also take a look at the `srn.conf` and `access.conf` files to make sure the settings are OK. Once the configuration files are set up the way you'd like, restart the Web server and you should be able to launch Word properly.

We need to build a disaster recovery plan for our intranet. What do you recommend?

Via the Internet

For starters, check out the Internet. It offers a wealth of information on crafting disaster recovery plans. Then, just do it:

Go online for these and other resources:

- A Deloitte & Touche white paper on the DRP process
- A description of business impact assessment procedures
- Guidelines for LAN recovery plan development

Assess the impact, analyze the risk, design a recovery strategy, develop the plan, test it and train on it. Like a fortune cookie once advised me: Decide today

what you will do if a dinosaur tries to eat you, for tomorrow may be too late.

Blass is a network architect at Sprint Paranet, Inc., a distributed computing systems services provider in Houston.



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The header file `<fcgi_stdio.h>` provides replacements for the standard I/O routines. In this example, the standard C function, `printf()`, has been redefined to route its output through the single FastCGI connection rather than through the standard I/O. Similar replacement functions are available for Perl and other programming languages. Developers can use the functions as examples for implementing FastCGI support.

`FCGI-Accept()` is at FastCGI's core. When called, it waits for a request from the Web server and blocks further execution of the program. When a request is received, `FCGI-Accept()` releases its block and allows the code in the body

information. The developer must ensure that anything left from a previous request does not affect a subsequent one.

Limited support, for now

The biggest drawback of FastCGI is lack of availability. Only a handful of Unix servers support the FastCGI protocol, and Web server vendors with their

own APIs are reluctant to adopt FastCGI.

For example, Netscape has no plans to support FastCGI in its Commerce Server and Microsoft is promoting its Transaction Server for running its dynamic page technology as persistent processes. Both vendors say if the market starts pushing FastCGI, they will consider adding support for it in their respective servers.

They may need to, and soon. Web application developers seem to be taking a liking to FastCGI. As one indicator, FastCGI support can be found on the Apache site, home of the Web's most popular server.

Parkhurst is a senior developer at Client/Server Labs, Inc., of Atlanta. He can be reached at www.csline.com.

Go online for more information on products that support FastCGI.

www.nwtfusion.com



of the while loop to be processed. The while loop then returns to `FCGI-Accept()` to wait for the next request. The use of the while loop is standard in FastCGI applications.

The `FCGI-Accept()` function also can detect whether the program was invoked from a CGI- or FastCGI-compliant server. If the function detects a CGI request, it will force an exit from the program after processing the request once, mimicking CGI behavior. In all other cases, the while loop will continue until the system administrator or the Web server kills the FastCGI application or the Web server exits.

In a more complex program, code can be inserted before and after the while statement to perform one-time initialization and cleanup. For example, a database connection can be made before the while statement and the proper database cleanup done immediately prior to exiting the program.

The FastCGI protocol supports defining roles for FastCGI programs. Roles tell a server how to process a request based on the path or URL file extension. Currently, FastCGI supports Responder, Filter and Authorizer roles.

Responder programs work identically to standard CGI programs: They receive a request and issue a direct response. Filter programs perform tasks such as on-the-fly document conversions, execution of embedded SQL queries or adding standard headers and footers to documents. Authorizer programs perform user verification and access control.

The bottom line

The development cycle on FastCGI programs tends to be lengthier than for CGI, but not significantly so. For example, most CGI applications make no attempt to close files or manage memory because the environment is cleaned when they exit. But FastCGI applications must do their own housekeeping because they stay active.

FastCGI programs also must make sure they carefully manage persistent



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Circle Reader Service #9

Digitivity's Cage:

Putting Java applets behind bars

BY MARK GIBBS



Start-up Digitivity, Inc. has developed a unique product that sweeps away Java security concerns.

After testing the product, called Cage, I've concluded that intranet managers grappling with Java applets will put Digitivity's offering into that rare can't-live-without category. That's because Cage will allow them to quarantine Java applets so they can't enter an intranet.

Cage provides a couple of additional benefits, too. It lets clients with low-power processors share a centralized, high-performance server for applet processing, and it seems to run applets more smoothly and faster than Java browsers do.

Knowing Java applets

Cage's usefulness is due to the limitations of the Java security model. An explanation of how Java applets are architected will foster an understanding of how security in the Cage environment works.

Creating an applet involves compiling Java source code into Java byte code, which can't execute on a processor because it isn't machine code. Java byte code requires that a run-time system, called a Java virtual machine (JVM), be executed.

When an applet is to be run, the Cage Server's JVM reads the byte code, validates it and then can interpret it directly or, in its next release, hand it to a just-in-time (JIT) compiler. The compiler will convert the byte code into machine code for execution, allowing for much better performance than if the byte code is interpreted by the JVM.

Digitivity model on a number of built-in limitations of the JVM. While these limitations significantly constrain what applets can do, they don't make it impossible for applets to perform hostile actions.

For example, an applet could run in such a way as to reduce system performance simply by executing a tight loop in the code or hogging a resource such as the sound subsystem. The result in both cases counts as a denial-of-service or nuisance attack. In many JVM implementations, breaking such a loop requires rebooting the computer.

While banning Java applets certainly addresses the security problem, it is hardly practical. So many commercial sites now make extensive use of applets, and so many useful applets are available that an alternative is required.

Digitivity's approach is the only one I've found that addresses the broad range of security concerns while still allowing Java applets to function normally. Cage isolates client systems from Java applet

code by running applets on a distinct machine—in other words, it removes direct client access to the applet.

With Cage, a specialized proxy server, called AppRouter, handles all HTTP and File Transfer Protocol requests. For this to happen, all browsers on the intranet have to be configured to use the AppRouter as a proxy. Typically, this modification can be done through the automatic browser proxy configuration in Netscape Communications Corp. and Microsoft Corp. browsers.

When a browser makes a request, the AppRouter passes it to the target server, which, incidentally, might be another proxy server as part

Go online for more information on securing Java applets.



www.nwfusion.com

PRODUCT CAPSULE

Name:	Cage
Current release:	1.0
Price:	\$7,500 for 25 concurrent users
Requirements:	Windows NT 4.0 with Service Pack 1 or later and 64M-byte RAM; Sun SPARCstation 5 with Solaris 2.5 and 64M-byte RAM. AppRouter and Cage Server each require 10M bytes disk space.
Vendor:	Digitivity, Inc., Los Altos, Calif.
Contact information:	Phone: (415) 947-1900 e-mail: info@digitivity.com URL: www.digitivity.com

ProxyApplet does nothing more than output display and capture user input.

Dctp, a data-only protocol, doesn't do anything other than transport data between the target applet and the ProxyApplet. Because no code is transferred and no processing is done at the client, the integrity of the client environment is maintained, even if a rogue applet causes the Cage Server to lock up or crash.

Building the Cage

While installing Cage is a breeze, eating up only about 15 minutes, you'll want to carefully plan the interaction of the Cage system with firewalls and proxy servers so you get the best possible security level. This requires an understanding of the protocols and connections involved.

In its documentation, Digitivity does a good job explaining architectural considerations and providing extensive explanations, worksheets and checklists to help you through the design process.

The Cage Server installs as an NT system service. Unlike many other products I've tested, I didn't even have to restart the system after installation. In fact, the Cage system starts the service and enables it to be automatically run at start-up. Once running, the only user interface to the Cage Server is through the NT Task Manager.

AppRouter has a user interface for configuration and monitoring.

In addition, it offers lots of reports that you can use to track what is being asked for and what response is made.

In Cage, Digitivity has definitely combined a great idea with an impressive implementation. Cage is one of the coolest products I've seen this year. ☺

PROS AND CONS Digitivity's Cage

Pros

- ▶ Allays some major Java applet security concerns
- ▶ Provides novel support for thin clients
- ▶ Improves applet performance

Cons

- ▶ Fairly complex to implement
- ▶ Adds a per-user cost of \$300

SUMMARY: Cage is an innovative solution that makes it possible to run Java applets without compromising intranet integrity.

RATING

Value for money	4
Intranet usefulness	5
Quality	4
Overall	4.3

1 is poor and 5 is excellent.

Because byte code is a much higher level language than machine code, it is possible to verify what the program is going to do. Illegal operations can be detected before execution, and the applet can be prevented from running.

But over and above this validation is the fact that Sun Microsystems, Inc. based its Java secu-

of a firewall. When it receives the response, the AppRouter examines the datastream looking for the HTML tags specifying that an applet is to be run. At this point, the AppRouter replaces the applet description with a specification for Digitivity's ProxyApplet, which is downloaded from the Cage Server.

Facing up to security

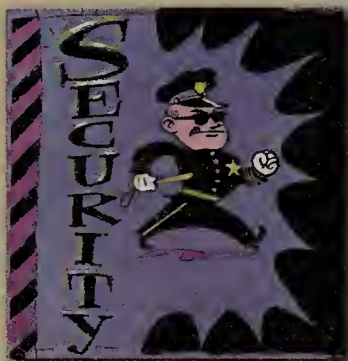
Biometrics finds an intranet niche

BY MARK GIBBS

Minus tremendous (and unwarranted) faith in the goodness of the world outside your organization and the staff within, you'll want to make sure your Internet and intranet connections and services are being used in a manner consistent with your security policies.

To this end, access control must be your first priority. The trouble is that users forget passwords, write them in easily found places (hint: look under the CEO's keyboard), and generally make access control a joke.

A solution to this problem is biometrics: the measurement of a person's biological attributes to establish his identity. While automatic fingerprinting and retinal scans are not yet commercially viable, face recognition is.



Log on to see

In the crop of emerging products, face recognition requires only a low-cost video

camera and a reasonably fast PC. To be recognized and log on to the system simply requires placing yourself in front of the camera. Everything else — recognition, authorization and logon — occurs automatically.

Even better, these products are being integrated with screen savers. This means that once the screen saver has been invoked, only the user of the current logon can unlock the PC.

If you need to secure your intranet terminals and your users are doing their best to thwart

you, face-recognition products are some of the most exciting, effective and cost-efficient security solutions available.

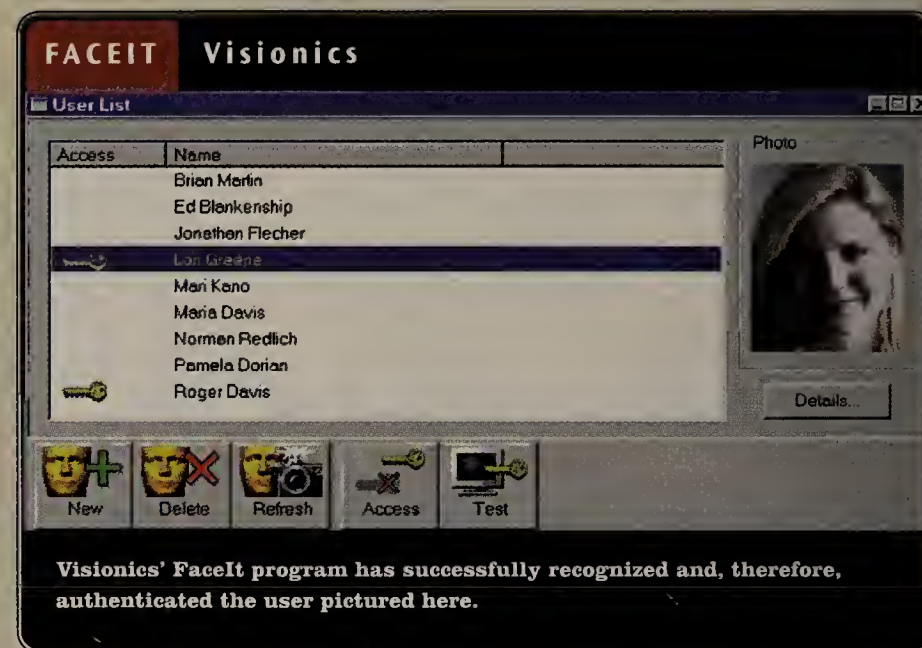
Smile!

A number of companies have been working on face-recognition technology. Miros, Inc., of Wellesley, Mass., for example, this month announced its offering, called TrueFace CyberWatch Logon95. CyberWatch, a neural network-based system, requires a basic training procedure for each user to be recognized. Once trained, users simply look at the camera to be validated and granted — or denied — access.

This robust face-recognition system is scheduled for use on an automated teller machine system (see www.miros.com/MrPayroll_PR.htm). The current Windows 95 release of TrueFace CyberWatch Logon95 is available by download from Miros' Web site or by direct order over the phone.

Miros offers a software developers' kit (SDK) as well as GateWatch, a hardware product. GateWatch is a turnkey, integrated system based on CyberWatch that controls door access. GateWatch features two cameras so that stereoscopic images can be used to defeat the possibility of a photograph being used to fool the system.

Another contender in the face-recognition market is Visionics Corp., with its FaceIt product. FaceIt, which also is neural network-based, boasts high tolerance for lighting conditions,



facial expressions and other environment variables along with real-time operation. It also can detect and reject attempts to use photographs and other frauds.

White Pine Software, Inc. has incorporated FaceIt into its CU-SeeMe videoconferencing system and, in a rather more critical situation, the Langkawi International Airport in Malaysia is using the product.

When passengers check in at Langkawi, their facial parameters are encoded onto smart cards embedded in their boarding passes. When a passenger boards the aircraft later, a real-time scan by FaceIt is compared with the data stored on the smart card to confirm the passenger's identity.

Visionics, of Metuchen, N.J., also offers an SDK and consulting to implement FaceIt for specialized applications and embedded solutions.

Identification and Verification International, Inc., of Valkaria, Fla., also released its face-recognition system, FaceKey II, this month. This is the least expensive system available. The complete source code and a developer's license costs \$495.

FaceKey II includes the ability for the software to activate an electronic door-lock mechanism via a printer port. The schematic and parts list for this application is included.

Face recognition is definitely one of the strongest contenders in the biometric-based security market. It can provide user-transparent verification — users do not have to be aware of the process or interact with the system. Plus, it's in real time. ☺

RECOGNIZING BIOMETRIC PRODUCTS

The following is a sampling of face-recognition products that could be used to secure an intranet.

Vendor	URL/Phone	Product	Pricing
Identification and Verification International	www.wp.com/IVS-face/ ; (407) 953-8235	FaceKey II	\$49.95
Miros	www.miros.com ; (617) 235-0330	TrueFace CyberWatch Logon95	\$59.95 by download, \$99.95 for phone order
Visionics	www.faceit.com ; (908) 744-1585	FaceIt	\$199.95

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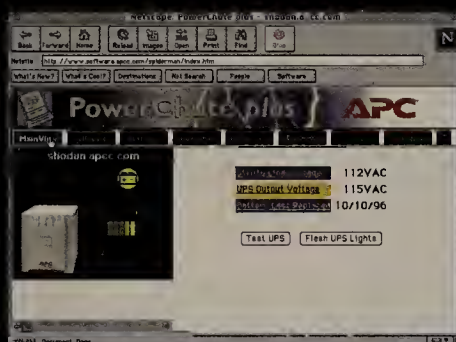
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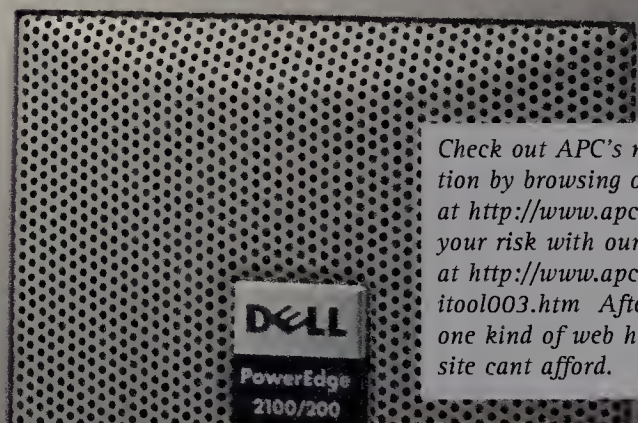
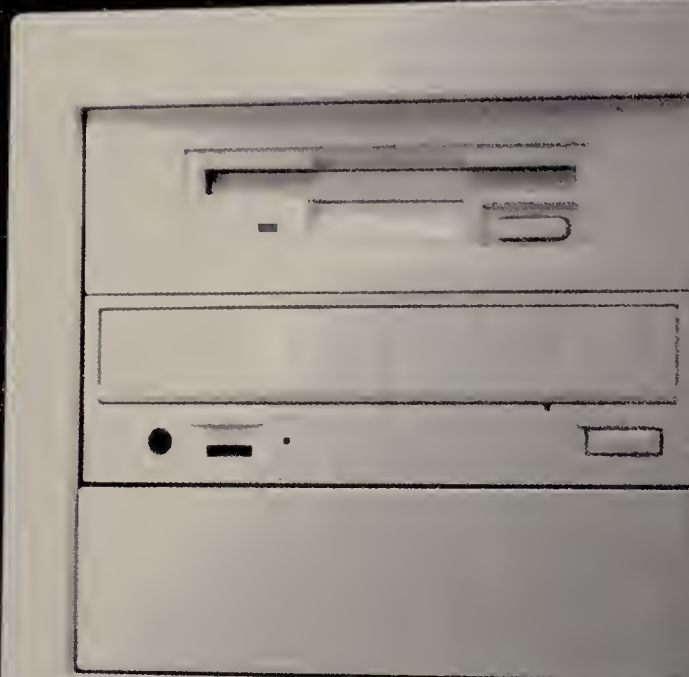
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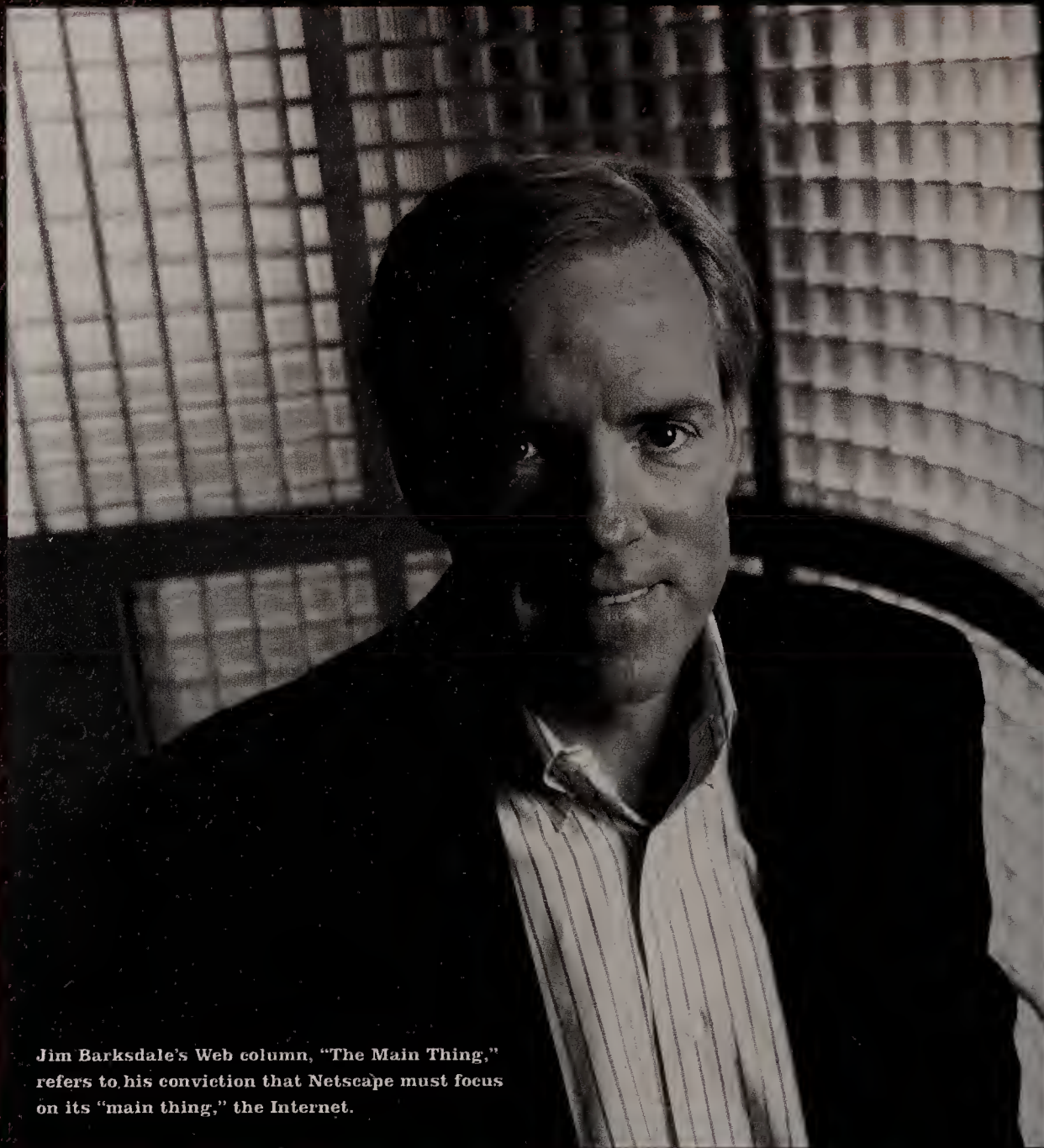
INTRAVIEW

&

Growing Mozilla

Jim Barksdale joined Netscape Communications Corp. as president and CEO in 1995 to provide day-to-day corporate management experience to the now 3-year-old Silicon Valley start-up. With cofounders Jim Clark and Marc Andreessen, browser designer, Barksdale has helped grow the user base from zero to 55 million.

Some cite Barksdale's hand in the maturing of Netscape, although the



Jim Barksdale's Web column, "The Main Thing," refers to his conviction that Netscape must focus on its "main thing," the Internet.

EDWARD CALDWELL

One of the wonderful things about Web browsers three years ago was their simplicity. But browsers have been getting more complicated — and fatter — ever since. Do your customers want browsers to be their interface to every business application? Is that what Netscape plans to provide them?

We're finding that more and more, customers use our Communicator client as the desktop environment from which all applications are accessed. We've evolved Communicator into an open e-mail, groupware and browser suite

to make it a tool users need every day to communicate, share and access information and applications on their intranets or the Internet.

We think the tight integration and ease of use of Communicator allows users to work smarter and faster. Users don't have to learn any dramatically new paradigms to get their work done and our customers really like this.

I would argue that clients — we no longer use the term browser because our product has far more functionality than browsing — have not been getting more complicated but in fact are easier than ever.

For example, take a look at bookmarking. In Navigator, bookmarks were added by a menu command that simply placed a bookmark at the bottom of a user's list. Bookmarks could be accessed only by using the Bookmarks window from the Window menu. We did studies with users and found out that bookmarks were an easy way to keep track of interesting or important sites, but that most users simply kept long, unorganized lists.

With Communicator, we've incorporated a Bookmark Quickfile button on the location toolbar for easy access and filing of bookmarks. This allows bookmarks to be organized when they are created. This is an area in which I think we've simplified and improved our product, not complicated it.

Is it fair to say that browsers are becoming environments? If so, how will that evolution change Netscape's priorities?

Yes, that's fair to say. We have always believed the client to be a user environment and our priorities have from the very early days been based around this understanding.

E-mail is an excellent example of how the client is becoming an environment. Users are spending a significant amount of time in the e-mail applications compared to a few years ago and e-mail is changing how people communicate and collaborate in the workplace. It's dissolving the barriers of time and distance. And



company still enjoys such levity as nicknaming updates to the flagship Navigator browser "Mozilla," for the company's lizard-like mascot. IntraNet questioned Barksdale about his plans and perspectives on Netscape, intranets and Web communications.



leverage these types of applications on their intranets.

Are Web servers going to be getting fatter as browsers have?

When Netscape was formed, we developed two basic Web servers. We've listened to the requests from our customers and have continued to add functionality. I guess Web

servers are getting fatter, but I believe this is a positive evolution. We can't build features fast enough.

How important are intranets to Netscape, anyway?

Intranet deployments are critical to Netscape. This is where much of the revenue opportunity is for us and our business has shifted so that intranets

represent a greater and greater amount of revenue. Our customers already have demonstrated strong demand for SuiteSpot and Communicator and are building and deploying large-scale intranets. Audi, Eastman Kodak, Knight-Ridder, Prudential and Shell plan to deploy a total of two million seats of Netscape software for messaging or Java/JavaScript applications. ☺

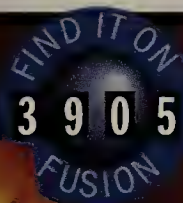
because of its efficiency and speed, e-mail is rapidly replacing letters, memos and even short reports as an organization's primary information- and data-exchange mechanism.

Another example of the client becoming an environment would be to look at our development of Netcaster technology. Netcaster dynamically delivers intranet and Internet information right to a user desktop. Users can subscribe to a content channel — similar to a broadcast TV or radio channel — and receive content that they can view offline. Users can keep their favorite channel on the desktop, creating a full-screen, information-centric workspace that we call a Webtop. Webtops enable users to work in familiar productivity applications while continuing to monitor frequently updated information delivered in the background throughout the day.

As far as our priorities, they remain the same: to evolve our Communicator software and to be innovative.

Go online for the full text of this Q&A.

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How should corporate customers, especially those with thriving intranets, be planning for the browser's evolution?

Corporations should direct their application investments toward applications that are client-enabled. Instead of developing and deploying complex, platform-specific applications, they should focus on 'crossware,' which are on-demand applications that run across networks and operating systems and are based entirely on open Internet standards like HTML, Java and JavaScript. Crossware can be easily extended to partners and customers and is uniquely suited to support projects and processes that span people and networks. These type of applications are different from traditional fat-client applications that are tied to particular operating systems and cannot scale or extend beyond the firewall.

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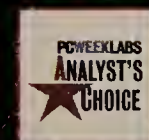


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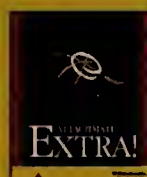
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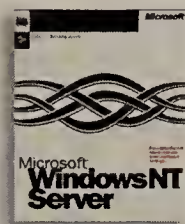


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what's doin' with

Domino?

Lotus got to the starting line late, but its Notes-powered Domino Web server has definitely placed it in the intranet game.

BY DALE COYNER

A little more than a year ago, industry pundits were shaking their heads, calling the Lotus Notes platform "the Apple Computer, Inc. of groupware," an innovator in its time but unable to adapt in a rapidly changing environment.

Doom was all but assured as investment in TCP/IP-based intranets skyrocketed, while Lotus Development Corp. had yet to articulate a clear response.

However, Lotus has executed a strategy over the past year to embrace the Internet's open environment in away that is reminiscent of the dramatic midcourse correction undertaken by Microsoft Corp. And the change appears to be paying off for the Cambridge, Mass., company.

A recent survey of companies using Version 1.5 of the Notes-powered Domino Web server indicates IT shops are beginning to build on the advantages of highly reusable templates and workflow automation offered by Notes. These features, combined with the ease of access and ubiquity of the Web browser, are making Notes applications available to larger audiences.

Reality check

So how is Lotus delivering on its promise to help companies "work the Web"?

Not bad, at least as far as The Prudential Insurance Company of America is concerned. Prudential, of Newark, N.J., has found that

Domino Web servers can play a key role in applications that accelerate the flow of information to and from the company's public Web site. The company sees immediate benefits in allowing customers to use its Internet site as a self-service data entry point. The Domino server ensures that queries submitted from the Internet are automatically sent to the right person within the company.

Prudential's Unclaimed Money Locator, an extranet application, highlights this interplay between Notes and the Web. Beneficiaries who believe Prudential might be holding the proceeds of an insurance policy can use a Domino-created form to initiate a search. After completing and submitting the form, the Domino host server transmits the request to another Domino server behind Prudential's firewall. Inside the company the request is routed to someone who can determine if the claim is valid.

Once Prudential makes a judgment, it notifies the claimant. "The system returns an e-mail that says, 'Sorry, we couldn't find a record of this,' or 'Yes, we'll be contacting you further,'" says Michael Mandelbaum, Prudential's vice president of information systems.

The company also uses a Domino server to host its intranet. Using Notes forms for input, the system allows any of Prudential's 30,000 Notes users to create content for the company's intranet and Internet sites without learning the intricacies of HTML. "People who

See Domino, page 19

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An intranet energized

Sandia National Labs pumps up its internal Web with a powerful workflow system for handling electronic transactions.

BY BETH SCHULTZ

Sandia National Laboratories began sharing information over an intranet long before most people ever heard the word. Now, three years into its venture, the organization is just about ready to get down to business.

It's not that Sandia's employees don't use their Web for business purposes. It has definitely become a part of their everyday work lives. But with the planned launch of several Web-based workflow applications next month, this U.S. Department of Energy (DOE) multiprogram science and engineering lab will take a giant leap toward its goal of conducting all internal business processes electronically. Activities such as filling out timecards, submitting purchase requisitions and filing expense reports will soon be Web-based transactions at the Albuquerque, N.M.-based lab, which is operated by a subsidiary of Lockheed Martin Corp.

Some of these transactions are straightforward. The employee fills out a form, hits the submit key and that's that. Others aren't so simple. Those transactions requiring approvals, sometimes at multiple levels of the corporate hierarchy, are, Sandia thinks, perfect workflow fodder.

It's early yet, but Web-based workflow will pervade Sandia, says Mike Eaton, chief information officer. "Anyone will be able to get on the workflow train."

Sandia had built its basic intranet infrastructure by early 1996 when the organization set its sights on Web-based workflow. It had done so for two reasons: cost and platform independence.

A workflow infrastructure project team began investigating client/server-based workflow packages. They found that, at \$500 to \$1,000 per user, they were too expensive. "Multiply that by 8,000 people,

and you're talking millions of dollars," says John Herzer, a senior programmer/analyst on the team. What's more, he adds, most didn't support all three of the platforms — Windows, Unix and Macintosh — in use at Sandia.

Scouring the market

Not wanting to develop a robust workflow engine, the team began looking for Web-based workflow products. It found only one. Action Technologies, Inc., of Alameda, Calif., had boosted a Webified version, called Metro, of its client/server workflow package. Sandia adopted it.

Actually, adapted is probably a better word. Sandia's workflow team customized much of the Metro package to reduce dependence on the vendor, says James Hutchins, leader of the workflow infrastructure project. Rather than deferring to Action's use of Microsoft Corp.'s SQL Server as a data repository, Sandia decided to integrate its Sybase, Inc. SQL Server database with Metro.

To do so, the workflow developers built a Common Gateway Interface (CGI) program. The program stores and retrieves most of the content entered and viewed by users via HTML forms in the Sybase database. A CGI script acts as a transaction center for business forms returned to the Web server. The script extracts the data, stores it in the database and calls Metro's APIs to record what has happened so that Metro can decide the next step in the process.

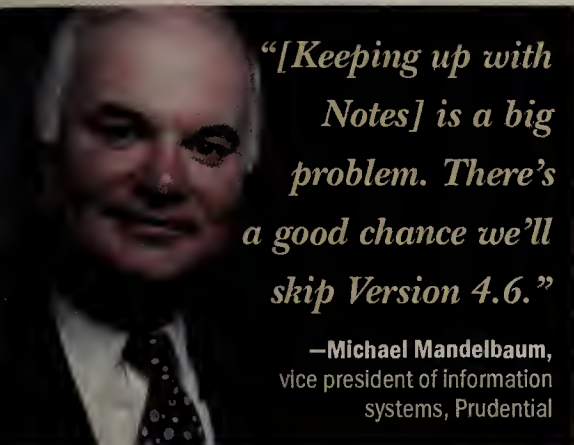
See Sandia, page 20





Domino, continued from page 16
populate our intranet don't even need to know how to spell HTML," Mandelbaum says.

Each document draws on common forms so that all pages have a similar look. The forms include links to a database of graphics to speed development.



"[Keeping up with Notes] is a big problem. There's a good chance we'll skip Version 4.6."

—Michael Mandelbaum,
vice president of information
systems, Prudential

Once a page is created, it is routed through a Notes workflow process for approvals before it is posted for viewing. "If users know enough to create a Notes e-mail, they know enough to use this [Domino] application," says Richard Werbin, Prudential's vice president

of information technology.

Prudential also uses its intranet and Domino's database features to automate the publication of job postings appearing on the company's Internet site. When a position is created, a member of the human resources department uses a Notes form to enter information about a new position.

When the position is submitted for posting, it is routed through Prudential's internal review process for sign-offs. Once approved, the position is automatically posted on the Internet without a Webmaster's intervention.

A work in progress

Like Web sites abounding with "Under Construction" disclaimers, Domino is still regarded as a work in progress. Now that Domino has been tested on the front lines of the enterprise, developers have discovered a number of issues to reconcile when Domino serves sophisticated workflow applications to Notes clients and Web browsers.

In light of the limitations of HTML, many developers have said they face the prospect of combining technologies to serve a Domino application to a

Web client. One challenge is separating navigation functions from content in a Web browser window. A commonly cited example is the stock discussion database that ships with Domino.

"How much work can it be to develop a Domino discussion database?" asks Curt Nelson, a principal of Silicon

Space, Inc., a Lotus business partner in San Diego, Calif. "The problem is, the functionality of the Domino discussion database is limited [compared with] the Netscape [Communications Corp.] newsreader."

For example, most newsreaders allow
See Domino, page 24

TOO MUCH OF A GOOD THING?

One overlooked aspect of rapid innovation is the burden placed on companies to test and deploy new versions of software. In the past two years, as Lotus Development Corp. has played catch-up with its Internet strategy, it has unleashed a blizzard of revisions and new products that has corporate IT strategists reeling from the rush.

With Notes Version 4.5 recently implemented at The Prudential Insurance Company of America and Versions 4.6 and 5.0 waiting in the wings, keeping the standard desktop up to date is tough.

"It's a big problem. There's a good chance we'll skip Version 4.6," says Michael Mandelbaum, Prudential's vice president of information systems.

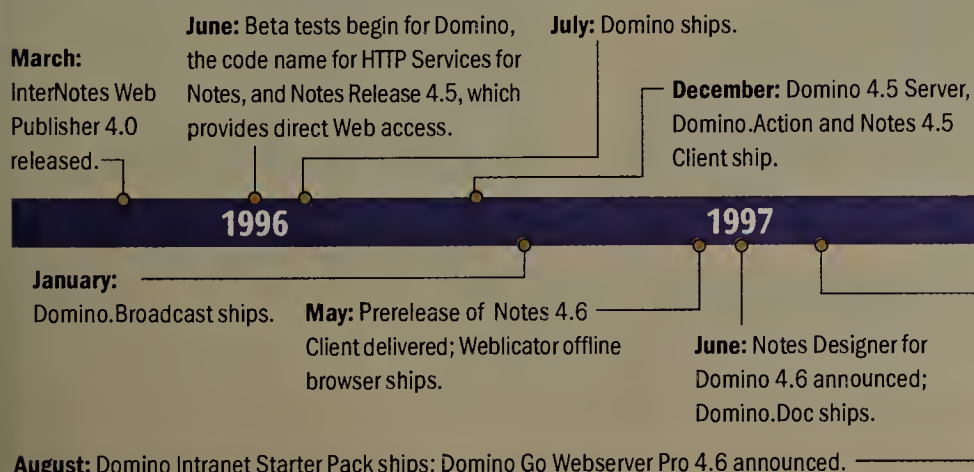
Highlights of Notes and Domino Server Version 4.6 include tighter ties with Microsoft Corp.'s ActiveX architecture and wider support for Internet standard protocols such as Post Office Protocol 3 and Simple Mail Transfer Protocol.

Getting the software to the desktop isn't all that needs to be addressed either, adds Richard Werbin, vice president of information technology for Prudential. "Rolling out a major new release of server- and client-side software is complicated by the need for end-user training on the new features added and changes to the user interface."

— Dale Coyner

WORKING THE PRODUCT MILL

Here are some highlights of Lotus' efforts to deliver Web functionality, fast.



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Sandia, *continued from page 18*

In this model, HTML/JavaScript forms call Sandia's Workflow CGI program, which validates fields against the Sybase tables and stores new transactions in the appropriate tables. The Workflow CGI program then calls Metro, passing on the key fields needed to retrieve the transaction again from the database. Similarly, the HTML form generated when users access their workflow workboxes is passed to the Workflow CGI program, which then extracts the full set of application data from the database and reconstructs the

application's HTML form.

The custom work helped the team bring Metro cleanly into Sandia's infrastructure, Herzer says. In addition to tying Metro into its Sybase human resources database, the team had to link it to a Kerberos server and Simple Mail Transfer Protocol-based e-mail backbone.

Headed overseas

The team's first stab at Web-based workflow was for a foreign travel request application, which went online last November. It served as a prototype

for the routing approval needed before DOE submission.

"This isn't a real high-use application, but it's important," Herzer says. The DOE requires any Sandian planning a trip abroad to obtain permission.

This approval could be night-

marish: A foreign travel request typically requires seven signatures before it even gets to the DOE, says John Abbott, a senior programmer/analyst.

Say a scientist has been invited to deliver a paper at a conference in France. Before the scientist says au revoir, he's got to sign off on the request himself, assuming he has had a secretary fill out the official form. He then must get approval from his group manager, director and vice president, as well as from the case manager and two security analysts. The first security analyst needs to okay the request at the beginning of the process and the second needs to review the approvals prior to sending the request to the DOE.

In the Web-based scenario, the routing list would be determined when the scientist fills in his Social Security number. Sandia runs that identifier against the HR database to determine routing.

Each person in the process is notified via e-mail that participation is required. Upon receiving notification,

the person would click on a link and be taken to a Web page that would list the items in that person's workbook. He or she would click on the foreign travel request item, verify the data and indicate approval or disapproval.

In another bit of custom work, the team has built proprietary extensions into the Web server that override Metro's security scheme. When the scientist's manager logs on to her Web-based

workbook, for example, a Java applet requests that she enter her user ID and password plus a Kerberos password, which is encrypted before being sent. The Web server confers with the Kerberos server for authentication.

The team expected that bringing the foreign travel request application into the Web-based workflow model would reduce the process from a week or more to a day or two. For the most part it has, but the foreign travel application also pointed out a major limitation of the workflow implementation. If someone in the approval chain is out of the office for the day, on vacation for two

POWERING THE WEB

Here's a look at some of the software Sandia uses on its Internal Web.

Browser: Netscape Navigator, running on Windows, Unix and Macintosh

Web server: Netscape servers, running on SGI's Challenge system

Primary authoring tools: AOL Press and Sausage Software's HotDog Pro

Application development tools: NetDynamics' NetDynamics Studio, Symantec's Visual Cafe and Visual Cafe Pro, Lotus Domino

Security mechanisms: Kerberos, SSL, DES encryption

JUST THE FACTS

The 8,000 browser-enabled Sandia employees make approximately 10 million document requests per month.

Admit it. This is what you'd like to do to hackers.



weeks or otherwise incommunicado, the travel request form would sit waiting for that person.

"The shortcoming of workflow products is that they're person-centric rather than process-centric," Hutchins says. "They tie the process to an individual's desktop by ID."

The team decided to change that by building what it calls the roles/delegation of authority (R/DA) interface. The idea is not only to allow delegations, but also to determine who plays certain roles and when those roles need to be performed. The team knew, in fact, that it could not bring other workflow applications onto the Web without the R/DA.

Go to the Web for more on Sandia's intranet, including:

- Developers' tips for implementing Web-based workflow
- A tour of two applications
- A discussion of future Web plans

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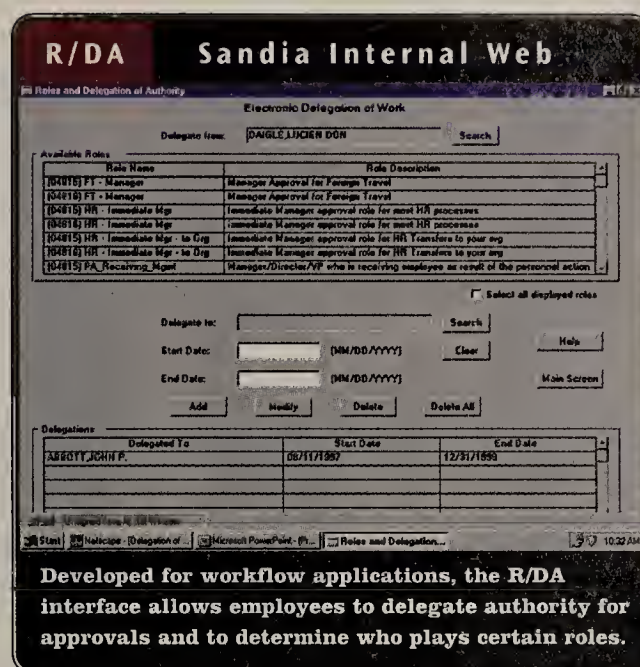


"With R/DA, workflow becomes role-centric, so you could assign something to the manager of Project 4815 rather than to someone," Hutchins says.

Personnel action and purchase requisition applications coming during the next two months will be the first Web-based workflow processes to use the R/DA interface. R/DA would determine what role someone needs to play based on certain input.

For the latter application, if our scientist wants to buy supplies costing more than \$5,000 but less than \$200,000, he'd have to get his manager's approval. For a purchase of more than \$200,000 but less than \$2 million, he'd need manager and director approvals. If the requisition is for more than \$2 million, a vice president also needs to sign off on it, says Abbott, noting that the figures aren't actuals.

If an approval is needed, the system will determine to whom the informa-



tion gets routed. If that person is not available, responsibility for the approval can be delegated to someone else.

R/DA comprises a data entry part for designating roles and delegations and a Java-based engine that interfaces with the application. Application developers load the engine into their programs, Abbott explains.

The workflow team relies on HR to

keep its database up to date so the R/DA interface stays in sync with the organizational chart. For the roles defined externally, or somewhere besides the HR database, the team updates the R/DA system nightly, Abbott says.

After the team brings up personnel action and purchase requisitions, it will retrofit the foreign travel application with R/DA and look for other opportunities. "We look at areas where there appears to be discontent, where the processing is too slow or ineffective, or where there are lots of approvals required," Herzer says.

On tap are workflow implementations of some manufacturing processes, a quality survey and unsatisfactory customer reports, for example. All of these have fairly rigid routing schemes, but the team also is looking at less structured workflow, Herzer says. For example, an engineer might want to use the workflow process to pass around a drawing, but would not need to rely on a formal routing structure.

The R/DA will help in all instances. CIO Eaton considers it a real enabler for Sandia's expanded use of Web-based transactions. "It puts the bedrock in place," Eaton says. ☺

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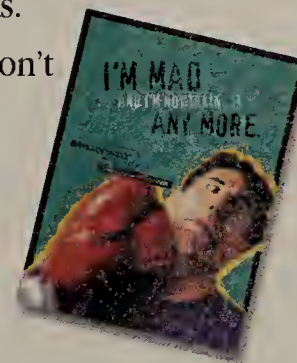
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CHOICE

What's your intranet's gig? Is it providing static documents for easier information gathering, boosting interactivity and collaboration among employees or forging new business relationships with corporate partners and customers? Perhaps, if you've been at it long enough, it's a mix of all three.

No matter where your intranet is headed, you've got to have a well-defined intranet tool set for getting it there. And sure, those Web browsers and servers and HTML authoring tools have an indispensable role, but they won't be the real hot items in your intranet tool belt.

Those would be the tools that let users interact with legacy systems, watch or listen to a presentation and drill down into data repositories. In other words, they're the tools that bring the intranet to life, that make it as critical to workaday life as water is to surfing.

We recently asked a few intranet developers what Web wares they couldn't live without.



Grasso (left), with fellow Web developers Ron Rub and Thomas Smith (right)

Rich Grasso
Project consultant
Time, Inc., New York

Tools of choice: Adobe Systems, Inc.'s PageMill, Photoshop and Freehand; Bluestone Software, Inc.'s Sapphire/Web.

Reasons being: Our philosophy has been to use tools that allow us to integrate best-of-breed products rather than depend upon one product to support all our needs. With this approach, we can use the most powerful tool available for a particular task.

We have shied away from total site development/management tools that take a Swiss Army-knife approach. While those tools are better integrated, easier to use and have a less steep learning curve, we believe they are better-suited to smaller, less complex sites. We require that our tools allow us to extend and augment built-in functionality through the use of custom code (preferably industry-standard rather than a proprietary scripting language).

Finally, we look for tools that are able to run in a heterogeneous environment. We need to be able to take advantage of the ease of use and lower costs

of the Windows NT/Intel platform and still be able to scale into the Unix world when our needs justify that investment.

In this respect, the ideal product should run equally well on all platforms we need to support. When we scale from an intranet with a few hundred users to an Internet site capable of handling thousands of simultaneous users, it is essential that we do not have to rewrite code because the tool set we chose is not transportable or does not support all features on all platforms.

We use Photoshop and Freehand to create the graphic elements that appear on our pages. We selected these tools because they are powerful, extensible and cross-platform. Additionally, due to their broad acceptance in the industry, we are pretty much assured that any graphic artist we hire will be familiar with the tools.

We chose PageMill for its WYSIWYG capabilities. PageMill allows us to easily lay out and manipulate the major elements on our pages, including the graphics created with Photoshop and Freehand. With PageMill, we are able to create pages with more visual appeal than pages created with a straight HTML tag editor.

Our site is data-intensive. Consequently, we are most dependent on the Sapphire/Web product. Using it, we can provide much of the functionality of a traditional client/server application in an online environment. More specifically, we chose Sapphire/Web because it integrates well with our Informix Software, Inc. Online 7.2 database management system, allows us to quickly and easily design queries and pro-

vides us with a framework to integrate the results of those queries into dynamic HTML pages.

While this is valuable, no tool can anticipate every need. If you cannot extend a product's functionality, you are locked into a close-ended tool and must limit the features of your Web site to the capabilities of the tool. While Sapphire/Web ships with a variety of routines that dictate the layout of data within the dynamic HTML pages it generates, there were times when we required functionality it did not have. Sapphire/Web allows us to write C code

Go online to find out what tools intranet developers at some leading Web consulting firms use to create their client sites.



www.nwfusion.com



Tools

Three Web developers reveal what tools they've just got to have when working on their company intranets.

to modify the behavior of the built-in callbacks or create our own callbacks that then easily integrate into the product. This is what we consider the most significant feature.

Sapphire/Web runs on a variety of platforms and supports all of them equally well. In our environment, we develop and test on Windows 95 as well as Irix, deploy on a Web server running on Irix and retrieve data from Informix 7.2 running on Solaris. Sapphire/Web also is flexible when deciding how to deploy; we can have users run individual sessions via compiled [Common Gateway Interface] scripts or provide access via an application server.

Most importantly, we've accomplished all of the above with one set of code.



Katie Aron
Programmer/analyst — intranet/Internet
CompuCom, Inc., Dallas

Tools of choice: Allaire Corp.'s Cold Fusion, Lotus Development Corp.'s Domino and Boutell.Com, Inc.'s Wusage

Reasons being: Allaire's Cold Fusion is an important tool for our intranet because it is used to implement many of our online forms and much of our interaction with Microsoft Access and our data warehouse. CompuCom associates use Cold Fusion applications to look up information on vendors, purchase orders, sales branch information, system alerts and much more, all through a Web browser.

Domino is used to interface with all the Lotus Notes databases we already have through a browser. Certain applications are developed more rapidly and are a better fit for Domino than Cold Fusion. Basically, Domino allows for easier execution of more complex forms and queries, especially when the database it's communicating with is already in Notes.

Wusage, for usage statistics, is an important program to have running on our server so we know how many associates are visiting the intranet and when. Being able to tell which pages are visited gives us hints as to what people most like to see, allowing us to keep these pages as up to date and user-friendly as possible. Also, statistics can show us how 'popular' the intranet is. Are hits going down? Maybe it's time to do a survey and find out why.

These tools make my job easier and boost the capabilities of the intranet. Users are happier because they can receive up-to-date information without having to search endlessly for it or go through a series of

phone calls and voice mails to find what they need.

Online forms make our company much more efficient. We can now move away from the old illegible fax transmissions and e-mails that contained inappropriate information to an approach where associates use online forms that force them to fill in all fields correctly and completely. These tools allow us to rapidly build applications that let nearly every important resource/database be accessed through one program — a Web browser.



Kathleen Warner
Vice president, Internet/
Intranet Deployment Office
Digital Equipment Corp., Maynard, Mass.

Tool of choice: Progressive Networks, Inc.'s RealAudio

Reasons being: Digital is looking for more effective ways to communicate with employees and to make training available through the intranet. We needed a solution that would allow Digital to move from providing static information to interactive communications that bring our messages and information to life. In addition, we needed to consider our existing computing environment, bandwidth requirements and cost-effectiveness.

Progressive Networks had the right multimedia product at the right time. The Digital Internet/Intranet Deployment Office selected Progressive Networks' RealAudio technology for two reasons:

First, we needed to deliver music-quality, audio-on-demand over the intranet to meet the needs of our most sophisticated desktop users. Second, this software is available on the Digital Alpha platform for Unix and NT.

This made it possible to replace videotapes with PowerPoint slides, which we prefer for internal training programs. Additionally, we could deliver training materials faster and at a lower cost. With intranet-based training, there are fewer travel expenses, facility rentals, handout materials and other expenses than with face-to-face training.

After conducting two pilots, we found that we could shorten the learning curve from development to implementation of multimedia projects and contain costs by taking advantage of a licensing program for Web sites. Since that time, there have been many other successful projects that allow us to extend our reach to employees with more impact and at a reasonable cost. ☺

TOOL PICKS

Product	Description	Vendor	Contact information
Cold Fusion	Web development tool	Allaire, Cambridge, Mass.	(617) 761-2000, www.allaire.com
Domino	Groupware and e-mail server for the Web	Lotus, Cambridge	(617) 577-8500, www2.lotus.com/domino.nsf
PageMill, Photoshop, Freehand	Web authoring tool, Design tool, Illustration tool	Adobe Systems, San Jose, Calif.	(408) 536-6000, www.adobe.com
RealAudio	Streaming audio	Progressive Networks, Seattle	(206) 674-2700, www.prognet.com
Sapphire/Web	Web application development tool	Bluestone Software, Mt. Laurel, N.J.	(609) 727-4600, www.bluestone.com
Wusage	Usage statistics for Web servers	Boutell.Com, Seattle	(206) 325-3009, www.boutell.com

Domino, continued from page 19
the user to simultaneously view the threads of conversation posted in a database and individual messages. However, in the standard Domino discussion database, navigational controls and content reside in the same window. This forces users to toggle between individual messages and the list of top-

ics, making it difficult to know where they are in a discussion.

Nelson says Silicon Space used HTML frames and JavaScript to overcome this problem, separating the two elements so users can see the list of topics and read individual messages at the same time. The company also supplemented the standard Domino icons with custom

graphics to make the application look and feel more like other newsreaders.

The shortcomings of HTML become more apparent as demand grows for real-time data, such as stock quotes and network-based collaboration tools. Lotus is responding with a set of Java-based applications — code-named Kona — that add features such as word

processing and spreadsheets to Web-based applications.

The Kona architecture also includes a communication specification called Kona Infobus, which allows applets on the same page to communicate with one another. Sun Microsystems, Inc. has licensed Infobus for incorporation into the Java standard.

While he believes Kona applications could address some of the advanced features he needs, Motti Goldberg, chief IT architect at Denver-based US WEST, Inc., is concerned about the lack of integration between Kona applets and Notes architecture. Goldberg says at present integrating Kona applets with a Domino server is no easier than with any other server.

"I do think Lotus should build applets that work everywhere, but they should be easier to integrate in a Notes architecture — otherwise, there is no advantage. I could just as easily use a Microsoft Web server," Goldberg says.

Some IT managers are more concerned about Notes features that may never work in a Web environment.

Chris Whitman, who manages a firmwide Notes installation at Ernst & Young LLP, a global professional services firm in New York, finds several sticking points with Domino. Chief among them is the inability to execute LotusScript in a Web environment.

"I rely on buttons and behind those buttons is a lot of LotusScript," Whitman says. "None of those buttons except the very first one is going to appear in a Domino scenario and none of the LotusScript in that button is going to work. Domino is not that big a player for me if I have to redesign all of my databases to take advantage of it."

While Lotus has pledged to provide seamless interoperability between Java and LotusScript, a scripting language similar to BASIC introduced with Notes Release 4.0, it has not set a timetable.

Citing concerns about scalability, Whitman also plans to test Lotus' claims about the workload Domino can

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handle. "Right now the documentation states that Domino will handle about 300 inquiries per minute. If it really can handle that kind of load, we're probably OK," he says.

The feature gap may lead to greater consequences than the need for creative workarounds. Goldberg says his company scrapped a Domino application in favor of a Notes-only solution once the client learned that key functionality would be difficult to implement for Web browsers.

Ultimately, Goldberg says, a transpar-

on its strengths as a mature and secure platform for collaborative development and workflow automation, Domino provides a tidy solution to data gathering and handling challenges that still perplex many developers.

What may be the best indicator of its future success is the support Lotus' strategy receives from its customers.

Shortcomings in Web functionality are a source of irritation, but most Notes managers express confidence that Lotus is heading in the right direction.

"I think you're going to see a Domino that's a lot more robust, will handle a lot more users at once and have a richer development environment," Whitman says.

And that's good news for those who plan to take Lotus at its word and work the Web with Domino.

Coyner is an executive producer of new media, including the intranet, for Ernst & Young, as well as a freelance writer. He can be reached at (703) 903-5527 or via the Internet at dale.coyner@ey.com.

If users know enough to create a Notes e-mail, they know enough to use this Domino application for creating intranet content.

—Richard Werblin, vice president of information technology, Prudential

ent client would eliminate the need for developers to design for two different platforms. "This probably means fully supporting Java or JavaScript or both in the development environment and the Notes clients," he says.

But it's still Notes

Apparently Lotus' ecumenical message that it has embraced standards hasn't reached everyone, notably traditional Web developers. Many still find the Notes development environment lacking, especially when compared to new visual Web development tools such as Fusion from NetObjects, Inc.

"A lot of the Web developers prefer what is, in my opinion, a hacker's environment," Goldberg says. "Domino is a more secure and well-defined development environment."

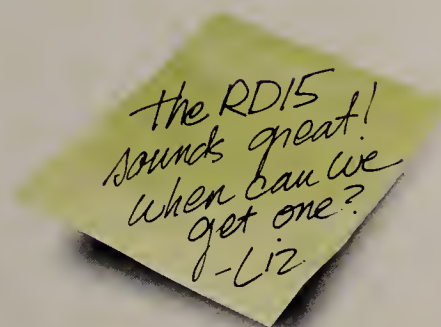
Accordingly, Goldberg feels a structured environment should allow a developer to realize higher productivity. However, some people still regard themselves as C or Java developers. The result, he says, is that "several groups within US WEST don't want to look at Domino because it still has this image of a closed environment."

To mitigate these concerns, Lotus introduced Domino.Action with Release 4.5 of its server. It sports a point-and-click interface, includes a site management tool and has prebuilt templates for common intranet functions.

Another possibility for the future is the integration of highly regarded Fusion as a development environment for Domino. Many have widely speculated that this is a major motive behind IBM's recent investment in NetObjects.

Lotus may have been late out of the starting gate, but few today doubt the platform's long-term viability. Building

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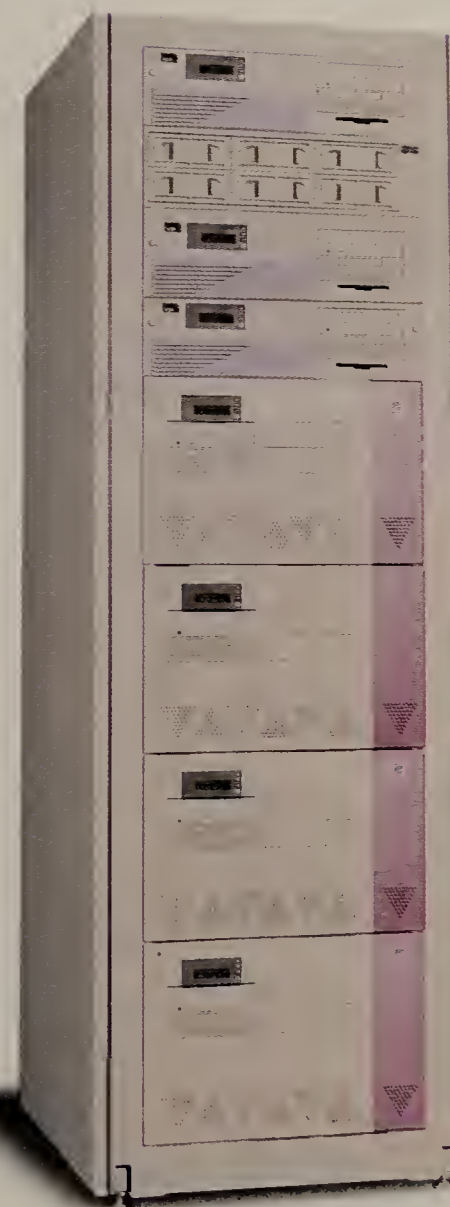
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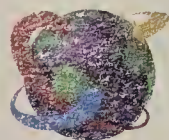


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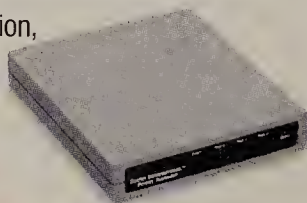
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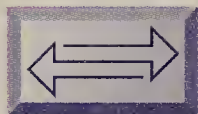


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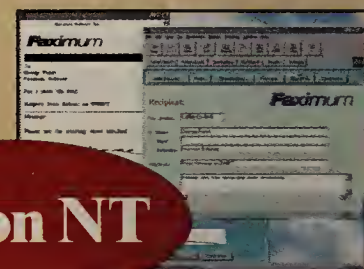
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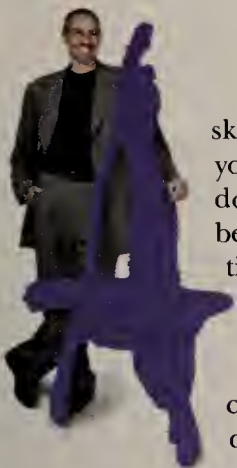
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Are you flying blind?



ask a seasoned aviator what it's like to fly a large aircraft, and you'll get a description of long periods of crushing boredom punctuated by moments of sheer terror. That's because the sophisticated instrumentation that turns routine flights into nonevents can't protect a pilot against the vagaries of weather and the sometimes unpredictable inner workings of large, complex machines.

But if a pilot does get into trouble, the instruments are crucial in determining if the aircraft is operating within design limits. (They also show which direction hell is in and how fast the aircraft is heading that way, but let's not dwell on the negative.) Fundamentally, flying a large aircraft without instruments is just not practical.

Like a large aircraft, any complex system requiring control has to have instrumentation. Otherwise, you could never determine what counts as baseline performance and which trends and events are significant.

When I talk to IT managers, it often comes out that they have little or no instrumentation for their intra-nets. This means they're attempting to drive a huge, complex machine that supports critical functions without knowing what counts as normal system behavior. In effect, they're flying blind.

So it's not surprising that when problems occur, the result is crash-and-burn with little warning. The you-know-what hits the fan.

Which reminds me of a wonderful story my father used to tell. Way back when, while at Idlewild (now Kennedy) airport on a test flight, he witnessed a DC-7 lose a piece of a propeller blade while warming its engines. The propeller chunk hurtled across the runway and hit the "honey wagon," which is the aviation industry's euphemism for the container holding aircraft waste. News of the event quickly traveled around the aviation world. After all, as my father explained it, for the first time in history, the fan had hit the s - - -.

But back to our topic: instrumentation, or the tools that measure, monitor and report system status on a real-time or delayed basis.

Instrumenting an intranet isn't that hard given that much of the functionality is built into the relative products. Most Web servers, for example, have several logs that provide a tremendous amount of information about server loading, the things people ask the server to do and the responses the server provides.

But making sense of this data is hard work without powerful

tools. Thank heaven for the enormous market that has developed for Web server log analysis tools.

Firewalls also keep logs. If hackers are attempting to enter your intranet, the logs will show their attack patterns.

The problem is a lot of system performance and event reports aren't easily understandable. Columns of figures don't tell a complete story. Graphical reporting tools are needed for that. For example, without a graphical report of your firewall log data, you'd probably miss the clusters of access attempts and logon failures that are the characteristic patterns of hacker attacks.

If your reporting tools can't plot event data graphically, you can simply work around the problem by exporting the data to a file you can dump into a spreadsheet. With judicious sorting, you then should be able to chart the data.

Indeed, chart everything you can. Chart server loading against time, chart content retrieval and searches by user. Chart errors and exceptions by user and against time. Chart server loading and errors against time. Three-dimensional plots often show surprising relationships among events.

Hacker attacks become obvious when access attempts and logon failures are plotted against time. Unless the hacker is sophisticated (possible) and patient (rarely), the attacks will show up as "clumps" of events. Once you know trouble is brewing, you can do something about it.

Developing your instrumentation strategy will require experimenting and analysis. But eventually, you'll discover the key measurements and conditions that define what counts as, returning to my aviation metaphor, flying straight, level and on course.

You also will be able to establish baseline traffic levels and what the week-to-week and month-to-month trends are for all services. Knowing what your intranet's growth looks like and where it's headed is vital

for capacity planning and budgeting.

But instrumentation alone isn't enough. You have to do something with all of the data, and it must be done regularly. Experience with your subsystems will tell you how often you need to run reports. Obviously, the frequency of reports on mission-critical functions and services will be greater than the frequency of reports that determine the status quo and trends.

Instrumentation is imperative. Without it, those moments of sheer terror will eventually cause you to crash and burn.

So check your instruments, zero your altimeter, and report to me via the Internet at imcolumn@gibbs.com or by phone at (800) 622-1108, Ext. 504.



JOEL NAKAMURA



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We are using Ascend Communications, Inc.'s Pipeline 50 router with an ISDN connection. The ISDN link drops occasionally, so we would like to set up an alternate link, possibly through a 33.6K bit/sec or ISDN modem, to either our current or another local Internet service provider. The goal is to add a little more bandwidth inexpensively and to add backup reliability. Do you have any suggestions?

Via the Internet

I have a few recommendations for the dropped ISDN problem:

- Ask your telephone company to watch the ISDN line for problems.
- See if there's a pattern for the times of occurrence or other factors.
- Ask Ascend if it has an upgrade or feature available for the Pipeline 50 that would automatically reconnect the line to your ISP.
- Check with your ISP to see if any other customers are reporting this problem and if it can connect you to a different router port.

For a backup link, a 33.6Kbit/sec modem is the least expensive option, since you can use a fax machine line, for example, as the backup link without requiring special hardware. You should see if the Pipeline 50 has an asynchronous port that can be configured for dial backup use when the ISDN line fails. Note that your ISP will need to support this type of function and may charge an additional fee for the service.

Using a second ISDN line would provide better bandwidth but is more costly as you would potentially need to install a second ISDN line at your office. The router needs to be able to send the command to the second ISDN modem to establish a connection if the primary connection fails. If the Ascend router doesn't have this function, you may want to look at Cisco Systems, Inc.'s 2500 series router.

Frame relay service, particularly with a burst option, may be worth looking into as well.

Network-based Web analysis tools help draw a detailed picture of site activities

By Bob Page

Server log files always have been looked to as the primary source of information regarding Web site traffic and user behavior.

The vast majority of Web site auditors and analysis tools are reliant on these log files, using their hit-based information to discover how much traffic a site received, where the visitors came from, how they navigated the site and how they responded to the online content.

However, as useful as that information can be, it's simply not enough.

The need for useful, reliable data regarding Web site performance that extends beyond the basics is growing.

Many Webmasters and online marketers now are looking to emerging technologies to pick up the slack.

On the wire

One of the most innovative and talked-about new methods of Web site analysis is the network-based data retrieval/analysis method.

Also known as "on the wire," this Web management method nearly bypasses log files altogether, instead collecting data directly from the network.

This system is proving to be superior to its log file cousins and is providing users with a more complete look at Web site activity and user behavior.

Log files, which contain a set of facts about each recorded hit, known as the Common Log Format (CLF), are rather limited in the amount of useful data they actually can provide.

Each hit is defined as a single request for information by the client and stored as soon as the information is sent out.

Because of this process, the log files are only capable of collecting data pertaining to the amount of information requested, from where it was requested and when it was requested.

Not only is this merely half the picture, but it also fails to reveal anything about the actual delivery of the information.

In addition, it is inaccurate.

For instance, because the hit is recorded as soon as the data is sent out, whether or not it ever reached its destination is not recorded.

Data requested and then canceled by the end user in mid-download is recorded as a successful transmission.

packet in minute detail.

That's because protocol analyzers mostly are used for protocol debugging and network testing.

Right place, wrong time

In other words, they collect the right information, but they collect too much of it and then present it all in a format better suited for quality analysis than for online marketing.

That's why revamped proto-

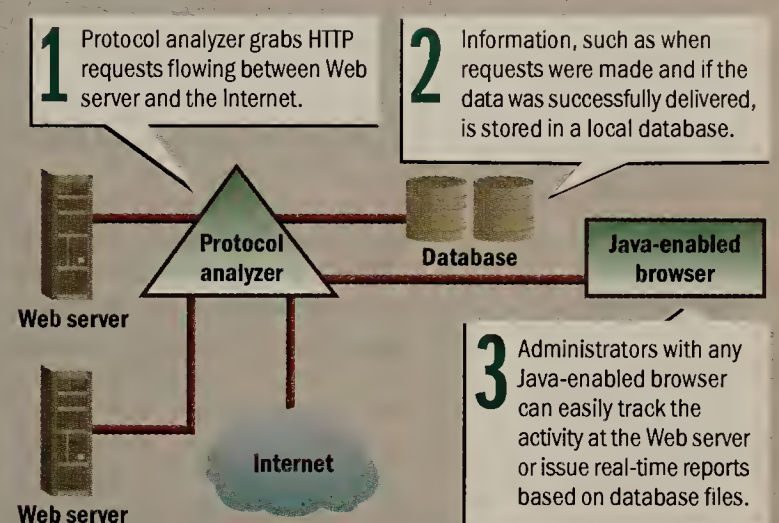
markedly superior to the log file system and answers a host of questions previously left unanswered.

For example, what happens to the average number of pages a Web surfer sees at a site when the server's response time goes from less than 2 seconds to more than 10 seconds? Which images are aborted the most? What are the users' effective line speeds? Is there a particular Common Gateway Interface program that

HOW IT WORKS

Watching over the Web site

Protocol analyzers specially tuned for HTTP traffic can help net administrators better manage their Web sites by offering them previously unavailable information such as when a client issued an HTTP request and how quickly the server responded to the request.



An on-the-wire collector, on the other hand, is located in between the network interface and the lowest level of the host's network code — the best location possible for intercepting HTTP traffic.

This unfiltered stream of data contains all of the communication between clients and the host server.

Also, from this viewpoint, the collector can view HTTP traffic for all Web servers on a particular network.

Therefore, one machine can collect statistics for many machines simultaneously, reducing the cost of manually administering log files on each of the Web servers.

Interestingly enough, a traditional protocol analyzer, which is the key to intercepting the network data, isn't typically useful for measuring performance, even though it can see every

col analyzers, such as the one being developed by Accrue Software, Inc., that are specially tuned for HTTP traffic, should help. On-the-wire analyzers don't spit out the gory details of each packet, but instead summarize the detailed facts about the transaction.

Like the CLF, extended CLF and Server API loggers, this new method knows that a page was requested (by whom, when, what browser and so on), as well as whether the page was successfully delivered.

In addition, the unique network characteristics of the transaction can be captured. For example, administrators would be able to determine when a server responded to a request for data.

Superior data

The amount of potential data available with this technology is

should be tuned because it is taking too long to run?

This kind of accuracy and wealth of information becomes a great foundation on which to analyze a Web site.

The combination of content and delivery makes for powerful analysis.

Page is the chief technology officer at Accrue Software. He can be reached at (408) 542-8900.

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Michael Cooney by phone at (508) 875-6400 or e-mail at michael_cooney@nww.com.



Why voice will shake up the entire industry

Voice is a commodity. That's the conventional wisdom. Big companies buy custom network contracts with per-minute voice rates so low it isn't worth talking about integrating voice and data on a single net.

Conventional wisdom soon will be turned on its head, and the industry is going to witness a fierce power struggle as we move — quickly — to true integration of packetized voice and data across frame relay and ATM, as well as intranets and the Internet.

Voice-data integration is hardly a new concept. For years, companies with private networks have merged voice and data traffic on access links to save money. That consolidation of traffic spawned the phenomenal growth of the T-1 multiplexer market in the '80s. However, that wasn't true integration. The two traffic types went over different channels in a fairly inflexible fashion.

But the industry's most powerful data equipment makers are now racing to voice-enable their products to integrate packetized voice and data traffic on more cost-effective carrier/Internet service provider services. Cisco, for one, is using the word "voice" in nearly all its positioning statements these days. Ascend also is giving its gear a voice boost, as CEO Mory Ejabat told *Network World* last week.

Cisco comes from the corporate market, while Ascend's roots are in

the carrier/ISP world. But both companies see the same future: voice and data traveling over flexible public network services. And they want the same thing: customers and carriers/ISPs using their equipment to handle that traffic. They don't care whether customers buy the equipment from them or bundled with services.

Ascend and Cisco aren't alone in their desire to control the integrated networks of the future. The top players in the voice world — Lucent, Alcatel and Nortel — are getting more aggressive about data. Expect these voice and data superpowers to collide head-on.

The impact of that collision will change the face of the industry. Today, we're accustomed to talking about the Big Four in the enterprise arena — Cisco, Bay, 3Com and Cabletron. Names such as Lucent, Nortel and Alcatel are better known for their telco deals. But all that will change because your buying criteria and network plans will change, as will those of the carriers and ISPs.

Some vendors won't be able to navigate the changes. Network equipment providers that aren't already drafting an integrated voice/data strategy may find themselves quickly left behind.

Who would have thought lowly voice traffic could bring about such a dramatic shift in the balance of power? Not bad for a commodity.

John Gallant, editor in chief

jgallant@nww.com

Merger mania • John Gerdelman

How to keep a merger from hurting your IT operation

Mergers and acquisitions (M&A) have been a key element of business strategy for quite a while. Lately, though, it seems the M&A process has been given a whole new emphasis as a strategy for enhancing the existing business by increasing market penetration, customer lock-in and global competitiveness.

I've been through four rounds of the M&A process during my career, at MCI and other organizations, and I have learned some important lessons. Here's my perspective on what it takes to help IT survive and thrive during a merger.

IT's mission is to put a systems infrastructure in place that will support the business, not run the merger. There are several guiding principles for prioritizing IT tasks.

First, consider the magnitude of the merger's impact on employees. Recognize that, as in any life crisis, people go through stages of acceptance and understanding. Provide the motivation, assurance and incentive that keeps morale high and encourages ongoing innovation.

To do this, follow the mantra, "Good now is better than perfect later." Keep IT staff focused on contributions and challenges without creating an atmosphere of anxiety that will inhibit their ability to perform their jobs.

Say what you like, but people really need the assurance and comfort that comes from knowing they are involved in vital pieces of the company's business. I want MCI's IT teams to believe that the degree of urgency in our organization is such that the company can't afford *not* to have them doing their jobs.

Next, invest your efforts in areas in which there is an identified or established market demand. As part of MCI's merger with British Telecommunications, we're going after the trillion-dollar global telecommunications market. networkMCI Services plays a large role in this effort by ensuring that other MCI business units have the technology and networks they need to win customers.

It's also good to make some solid, quick hits to show the IT team that significant synergies from the merger are possible, the process is working and people who support it will do well.

For example, we picked two key projects each from MCI's call center applications group and BT's large account billing solutions group and got project teams from both companies working together early

on. As a result, senior IT teams are developing better products faster and saving time and money.

It's important that results have visibility. The eyes of your customers, competitors and, most importantly, employees are upon you. A highly visible project, successfully completed, goes a long way toward supporting a successful merger.

Prioritize projects based on their management time demands. At MCI, a project that requires less of senior IT managers' time to oversee will typically get priority over a project requiring lots of hand-holding.

Benchmark your performance objectives. This involves linking IT performance to financial performance, the key ingredients of which are customer satisfaction, employee satisfaction, growth and innovation, and business process effectiveness and efficiency. It also involves measuring yourself against some tough criteria. These include your own history of success, direct and indirect competitors and existing best-in-class applications and always striving for better performing applications, more elegant code, faster integration and so forth.

Mergers are never easy. Time is short, emotions are high and business priorities don't go away. Remember that IT is part of running the business first and part of a merger second. Striving for good now rather than perfect later will take much of the anxiety out of your IT team's day-to-day activities, while ensuring focus on quality. This helps whether the merger involves your department, division or entire company.

Gerdelman is president of networkMCI Services, which provides the network and systems infrastructure that supports all of MCI's products and services. He can be reached at 7512294@mcimail.com.



Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

X marks the spot

Regarding your editorial "Police the 'Net, don't regulate it" (Aug. 18, page 48):

I agree with your statement that Web site ads are killing newsgroups. I read a number of networking and computer related groups and often find ads for X-rated Web sites in them.

A few months ago I posted to comp.protocols.tcp-ip about having a specific port for X-rated Web sites. The home page could be on port 80, so that there would be no extra number to remember, and the links to the real X-rated pages would include the number. This would be self-regulated, probably

High-Speed Token Ring: More Band-Aid than boon

For companies looking to extend the life of their token-ring networks, the industry movement to create a high-speed version of token ring clearly is good news (NW, Sept. 1, page 1). However, if you think it's a long-term strategic solution, think again.

Token ring always has been more expensive than Ethernet technology, and that fact isn't going to change. Consider Olicom's and its OEM customer Cisco's recent announcements of next-generation token-ring switches (NW, Aug. 4, page 1). These 20-port switches support 4M or 16M bit/sec operation and range in price from \$400 to \$450 per port. In contrast, Bay Networks and other vendors this year have delivered 10M/100M bit/sec Ethernet switches in the \$250-per-port range. In terms of megabit/sec per dollar, it's clear that switched Ethernet is a far better deal than switched token ring.

We've also heard two other token ring/Ethernet comparisons that are worth repeating. One is that the cost of a 16M bit/sec port on a token-ring hub is about the same as the cost of a 10M bit/sec Ethernet switch port. The other comparison is that the cost of a 16M bit/sec PCI-based token-ring network interface card (NIC) is about the same as a switched Ethernet port. These are pretty sobering numbers; you get so much more for your Ethernet dollar.

While lower costs are possible with token ring, it's unlikely the technology will ever reach parity with Ethernet. To its credit, the IEEE 802.5 Token Ring Working Group plans to leverage the physical-layer technology developed for 100Base-T (Fast Ethernet) in developing a 100M bit/sec switched token-ring specification.

This decision will certainly speed the delivery of High-Speed Token Ring to the market. However, it doesn't mean that the price per port for 100M bit/sec token-ring switches will be as low as prices for 100M bit/sec Ethernet switches. Ditto for NICs. You'll likely pay at least a 20% premium for 100M bit/sec token ring.

Dollars aside, consider that some of the characteristics that made token ring technically superior to Ethernet as a shared media essentially are lost in a switched environment. In a switched environment, communication is point to point, so the access control method is irrelevant. So while token ring's token-passing scheme clearly yields higher throughput than Ethernet's carrier-sense multiple access with collision detection scheme in a shared environment, it buys you nothing in a switched environment.

Likewise, token ring's priority scheme no longer gives it an edge over Ethernet. Under the IEEE 802.1p and 802.1q standards, Ethernet and token ring will have an eight-level priority scheme as part of virtual LAN tags.

One aspect of token ring that will stay the same at higher speeds is its large packet size. While Ethernet packets can be a maximum of 1,500 bytes, token-ring packets

can top out at 18,000 bytes. On the plus side, it's more efficient to pass large packets, particularly at high speeds. On the minus side, switch vendors must provide larger buffers to handle the larger packets, which increases switch prices. Some vendors will choose not to support large token-ring packets to avoid the extra buffer costs.

A third issue to consider is feature richness. Token-ring products are likely to lag behind their Ethernet counterparts in supporting new capabilities, such as quality of service via the Resource Reservation Protocol and VLAN and traffic prioritization via the IEEE 802.1p and 802.1q specifications.

The reason for this lag has nothing to do with standards, which fortunately are being defined in parallel for Ethernet and token ring. However, given a limited amount of resources, many vendors are likely to deliver new capabilities on Ethernet devices first, simply because the Ethernet market is larger and they can recoup their investment more rapidly.

A fourth area in which token-ring users aren't likely to reap the same benefits as Ethernet customers is in Layer 3 (network layer) switching, particularly the group of devices known as routing switches. For example, Bay acquired a family of routing switches when it purchased Rapid City earlier this summer. The devices combine Layer 2 switching with IP routing at a forwarding rate of 7 million packet/sec. Although Bay has not yet released its pricing for the products, Rapid City has announced pricing in the \$700 to \$1,200 range for 10M/100M bit/sec ports.

Similarly, 3Com recently unveiled its CoreBuilder 3500, a Layer 3 switch that provides Layer 2 switching along with routing for IP and IPX at 3.5 million packet/sec. Pricing ranges from about \$1,000 to \$2,200 per 10M/100M bit/sec Ethernet port, depending on configuration.

These are impressive numbers in terms of performance and pricing. And they're going to get even more impressive as the trickle of Layer 3 Ethernet switches coming to market becomes a flood. Unfortunately, no similar deluge of token-ring products is on the horizon.

For many organizations, it will make sense to use high-speed token-ring products to extend the life of token-ring networks that support existing applications. However, for new network installations and applications, token-ring shops should look hard at the cost/benefit ratio of token ring vs. Ethernet. In a switched network environment, you may find that the reasons why you originally chose token-ring technology no longer hold up.

Petrosky is a senior analyst with The Burton Group, an information services firm that provides in-depth technology analysis. She can be reached at (415) 572-0560 or petrosky@tbgroup.com.

by complaints to Internet service providers about noncompliers. Readers of that newsgroup showed no interest in my proposal.

I am not against X-rated Web sites, but it would be nice to be able to keep them from crowding useful posts out of newsgroups.

*Glen Herrmannsfeldt
Seattle*

Unix rules

Regarding Wayne Spivak's column "Doing the math to resolve the NT vs. Unix debate" (Aug. 18, page 48):

I agree with Spivak that a flavor of Unix is a better operating system choice for an ISP server. However, his Linux information is incomplete.

There are consultants that support Linux in every state. They are featured monthly in the Linux Journal (www.ssc.com). In addition, Linux

reseller Caldera (www.caldera.com) offers commercial support contracts.

*Mark Schlough
Minneapolis*

Wayne Spivak is right in advising ISPs to run Unix rather than Windows NT. I keep in close contact with my ISP, which runs Berkeley Software Design Unix on all of its machines and likes it very much. If for no other reason than the cost of hardware, Unix is the way to go.

*Matt Jurcich
Network administrator
CFG Insurance Services
Minnetonka, Minn.*

Absorbing Apple

Mark Gibbs' column "An Apple for Bill means you will be assimilated" (Aug. 18, page 84) was excellent. I think it is a shame that Steve Jobs came back to Apple simply to make a

fast buck before he heads off to his next project.

In the past few years, Apple has made so many bad decisions that they are almost too numerous to count. But two of them stick out: turning down IBM's buyout offer at \$60 per share and purchasing NeXT, which brought Jobs back into the picture.

Apple could have been a separate company with the backing of IBM, as Lotus is today, but their egos wouldn't let them. Now they are kneeling at the feet of Bill, praying that he won't absorb them.

*Michael Barrett
Clarion, Pa.*

Mark Gibbs states: "The MacOS won't vanish overnight; it will be absorbed. Windows will become more Mac-like, and the MacOS will just fade away."

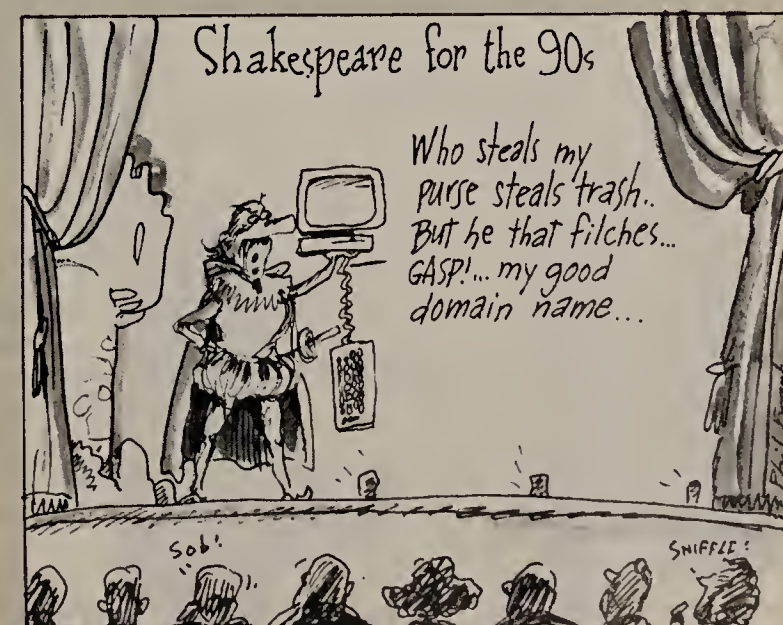
Oh, rats . . . I was hoping

Gibbs would say, "The MacOS won't vanish overnight; it will be completely assimilated by the overwhelming superiority of NeXT, which will be renamed MacOS/Win." Now

that might be worth the self-sacrifice of Apple.

*Royce Bell
Principal
@webtique
San Bernardino, Calif.*

Teletoons



THE SET PROTOCOL FOR INTERNET COMMERCE IS DRAWING FIRE, AND JUSTIFIABLY SO, BUT IT'S STILL OUR BEST BET.

The future is not yet SET

By Timothy Haight

Back in early 1996, we were told that by now millions of us would be making credit card purchases across the Internet. Our security concerns would be a distant memory thanks to the Secure Electronic Transaction (SET) protocol. With Visa International, Inc. and MasterCard International, Inc. pulling the strings behind the scenes, SET would take care of all our security woes, setting in motion a frenzy of buying activity across the 'Net.

It's been a full 18 months since the announcement of SET Version 1.0, and it's safe to say that didn't happen. And while a flurry of announcements of field trials, implementations and industry support can give the impression that SET is back on track, beneath the surface lies a host of issues that will likely push any widespread SET implementations off for another 18 months.

Questions abound about how to safely distribute and protect the digital certificates that are key to

SET, or whether, in practice, they will be used at all. There's debate as to whether SET's security mechanisms break down by giving merchants and banks too much freedom in how they deal with credit card numbers. There's also the question of who will be left holding the bag in the case of fraudulent transactions; Visa and MasterCard so far are refusing to shoulder that burden.

Meanwhile, smart card technology, which backers say is less cumbersome and more secure than SET, is

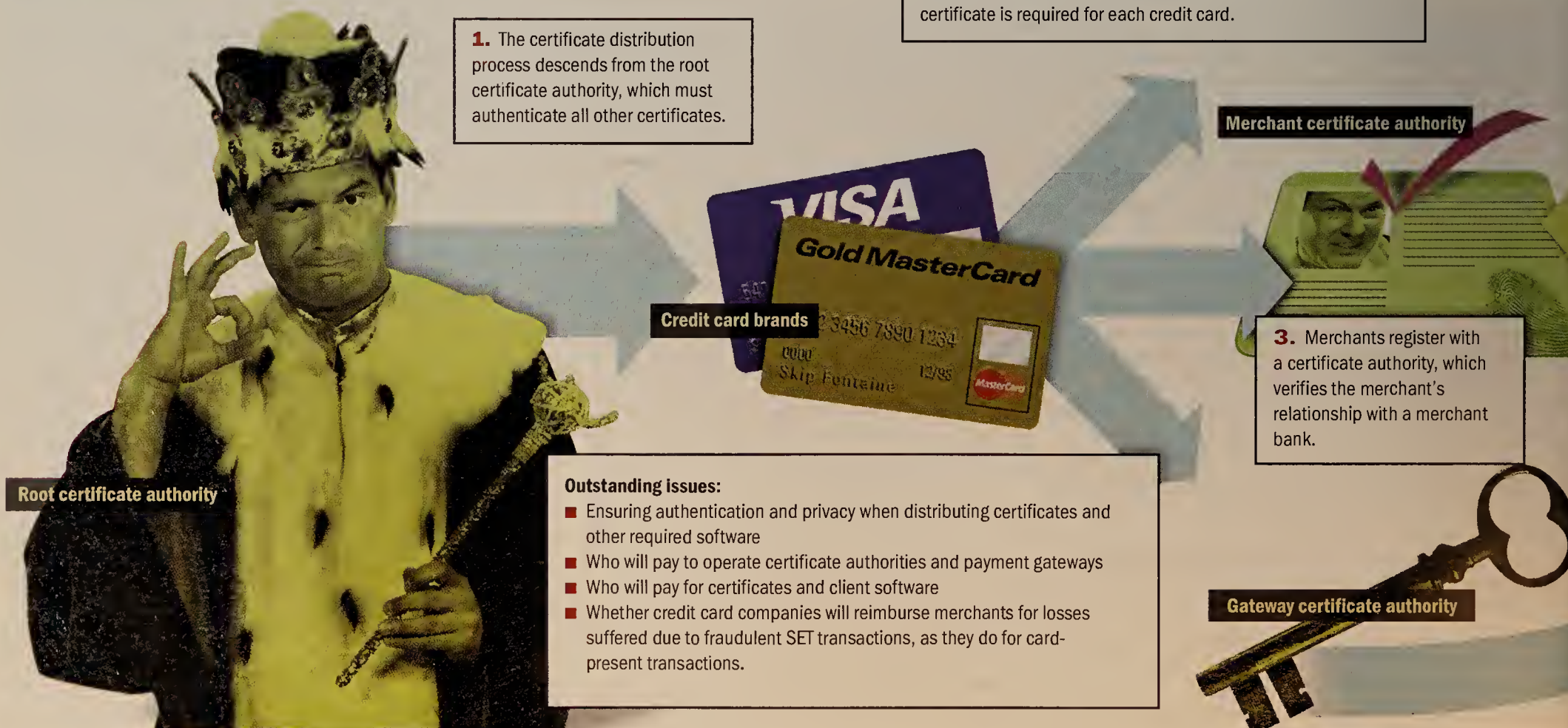
making significant advances. Visa and MasterCard, in fact, have supported major smart card initiatives abroad. They also have plans for smart card deployment in the U.S., although that's even further down the road and is not intended to replace SET.

What SET is supposed to do

SET is intended to provide encryption and authentication for Internet credit card transactions. It achieves this by establishing a system of encrypted communication using public and private keys, digital signatures and authenticating certificates. The result, according to its creators — which include Visa, MasterCard, Netscape Communications Corp., Microsoft Corp., IBM, GTE Corp., Science Applications International Corp. (SAIC), Terisa

FROM CERTIFICATES TO PURCHASE: HOW SET WORKS

CERTIFICATE DISTRIBUTION





Systems, Inc. and VeriSign, Inc. — should be Internet-based credit transactions that are as safe as face-to-face credit card purchases.

Today, card-present transactions are considered so much safer than mail, telephone and Internet-based orders that credit card companies such as Visa and MasterCard absorb the merchant's loss if the transaction is fraudulent. Banks also charge merchants a lower fee for each card-present transaction.

Under SET, sending a certificate through cyberspace is expected to be the equivalent of showing the plastic card. "Today, electronic merchants have no idea whether they're dealing with a computer program to generate account numbers," says Steve Herz, senior vice president for electronic commerce for Visa. "With SET, they will have the same confidence and know they will get paid in the same way as with the rules in the physical world."

Observers generally agree that SET's authentication system appears effective. When a merchant receives an order from a computer with a SET certificate on it, the merchant can determine there is a valid credit card behind the certificate. Similarly, customers can be assured they are dealing with a genuine merchant who has been certified by a credit card brand such as Visa, MasterCard or American Express Co. The merchant has a similar assurance dealing with the gateway to the bank to which it

submits credit card orders for payment.

Where SET stops short

Potential problems are uncovered, however, when you look at what SET doesn't address. Among the problems are the following:

- The specification says nothing about how banks approve customers to receive certificates.
- It doesn't guarantee "nonrepudiation," which means a merchant has no foolproof way to prove an order was placed by the customer to whom the certificate was assigned. If you have a SET certificate and software on your computer at work, for example, another worker could use it while you're gone, using a password-cracking program to guess your password.
- SET allows significant latitude in its practices, which may undercut its other features. For example, one of the advantages of SET's use of identifying certificates and keys is that the merchant's computer never possesses the cardholder's actual credit card number during the transaction. Many merchants, however, use customers' credit card numbers to index various records in their legacy computer systems. The SET specification, therefore, allows banks to give credit card numbers back to merchants after the transaction. The result is that the numbers may be stored on the merchants' computers and, therefore, potentially be vulnerable to attack. SET says nothing about how to keep such data safe, whether it resides on computers belonging to the consumer, merchant or bank.

Visa's Herz confirms this is so. "The merchant has a relationship with the merchant bank, as it does today. After the transaction process, whatever the merchant bank and the merchant do is up to them," he says. William Campbell, vice president of technology services for Bank of America, adds, "The credit card associations will bless our ability to return credit

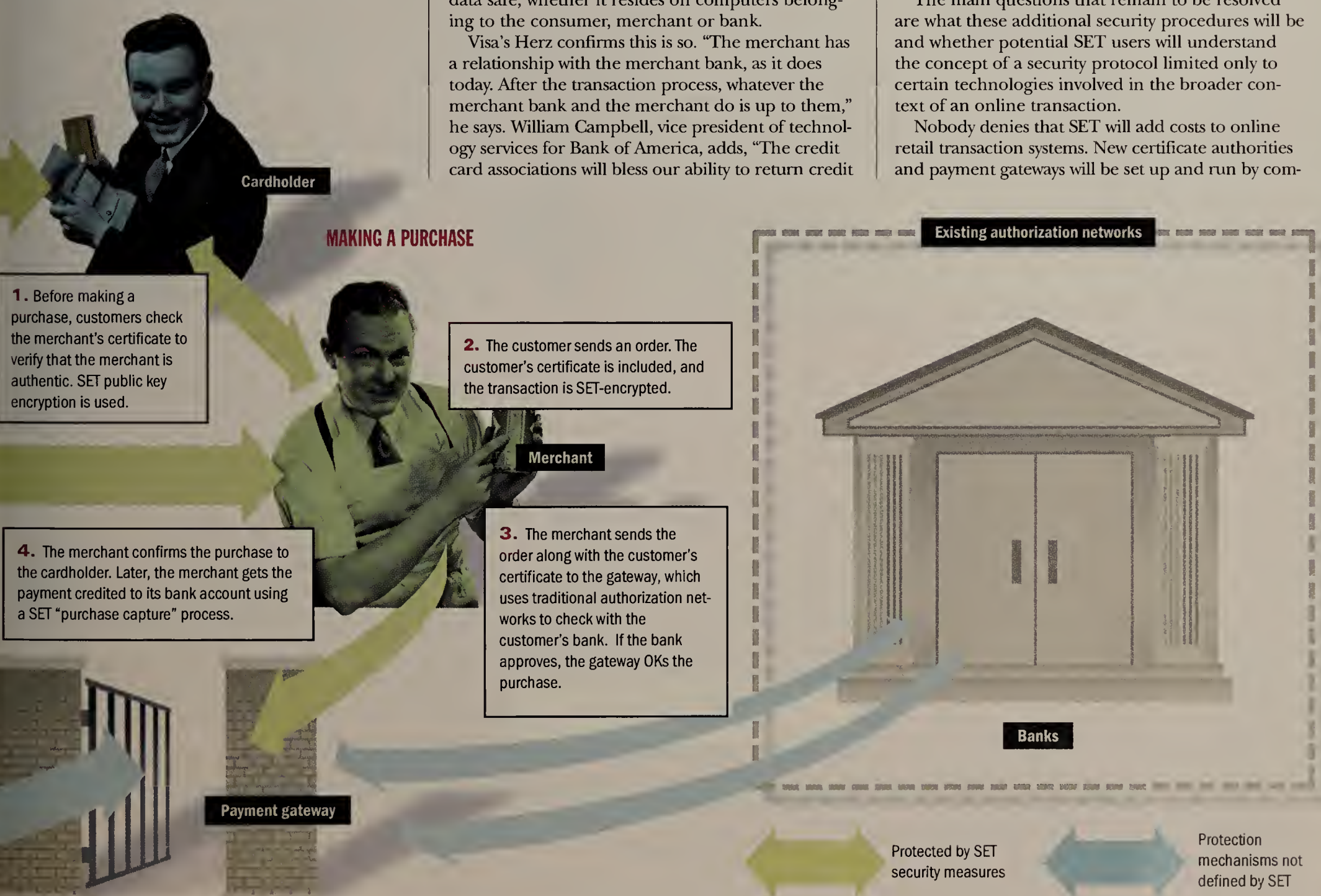
card transaction information to a merchant. Our challenge is to identify a methodology to do that, such as an out-of-band distribution off the Internet."

● The SET 1.0 specification also states that "cardholder certificates are optional at the payment card brand's discretion." This is considered an interim step in a period during which many potential online customers may not have acquired certificates. But Steven Klebe, senior vice president of sales and marketing at CyberSource Corp., the parent company of online vendor software.net, wonders whether this loophole will allow nonauthenticated transactions to go on indefinitely. "Is a merchant going to want anything to disrupt the buying experience to the point where they are going to say to a customer, 'I can't sell you this because you don't have a certificate?' As long as that hole exists, then the consumer will say, 'Why bother to get a certificate?'"

Defenders of SET argue that it's too much to ask the protocol to guard against every eventuality, given the diversity of the customers and institutions that will participate in the process. They say consumers will be protected against loss in the same way they are protected with plastic credit cards, where the risk is limited to \$50. Merchants will have a strong motivation to address their own security problems to protect themselves, just as they do today, as will banks and others involved in SET transactions.

The main questions that remain to be resolved are what these additional security procedures will be and whether potential SET users will understand the concept of a security protocol limited only to certain technologies involved in the broader context of an online transaction.

Nobody denies that SET will add costs to online retail transaction systems. New certificate authorities and payment gateways will be set up and run by com-



panies such as SPYRUS, Inc., CertCo LLC, VeriSign, which will be Visa's certificate provider, and GTE, which will be MasterCard's. They will have to be paid, but nobody has yet specified who will pay them. Banks will establish certificate authorities and gateways within their organizations or outsource those functions. The banks' costs may or may not be passed on to merchants and consumers. We don't know yet.

Merchants and consumers will have to obtain new software and certificates. In addition, merchants may be required to purchase some new hardware. In most cases, costs for these items have not yet been determined.

Campbell, who is involved in a SET trial with Visa, First Union Bank Corp. and Alaska Airlines, says the bank hasn't decided whether to charge credit card customers for certificates and software. "That's one of the things we'll learn from this trial. What we don't know is how the folks who didn't get wallets [SET client software] will make contact with the bank to look for them, which is a way to estimate customer demand," he says.

Online merchants not impressed

Meanwhile, successful electronic merchants are asking how they benefit. "We do have some concerns, as a merchant, about what [SET] buys us. Will it mitigate our fraud risk? We haven't heard that yet," says William McKiernan, president and CEO of CyberSource, whose software.net Web site currently grosses more than \$1 million each month.

Paul Graham, president of Viaweb, Inc., which operates the viaweb.com electronic commerce hosting service and the viamall.com electronic mall, is more emphatic: "The only beneficiary of SET is the credit card company. It doesn't make anything better for the merchant or the consumer." Graham says the merchants he supports have preferred to use their existing credit authorization systems, rather than set up new systems without clear economic benefits.

Most observers believe if credit card companies such as Visa came forward and gave merchants the same antifraud guarantees as in card-present encounters, it would encourage merchants to participate in SET. Visa, for one, isn't ready to do that. Visa's Herz says merchants "will be able to take transactions with the same confidence as in the physical world." How that translates to Visa guaranteeing against fraud losses in a SET transaction, however, "boils down to rules and regulations, involving not only the validity of the transaction but other rules that will help insure the integrity in an Internet payment." And those further rules have not been established.

The slow pace of change

Amid the squabbling, SET trials involving Visa and MasterCard are being conducted in 25 countries, according to Herz. Meanwhile, banks and the credit card companies are working to draw up all the supplementary rules and regulations that must surround SET. The upshot of all this is full SET implementation is going to take a while.

Cliff Condon, senior analyst for Money and Technology at Forrester Research, Inc., in Boston, says, "We will not see any large-scale roll-outs in the next 18 months." He cites four rea-

sons: Merchants want lower fees on SET-based transactions than they currently pay for transactions in which there is no physical card present; extensive marketing and consumer education programs need to be formulated and launched; SET compliance measures for software and merchants' sites need to be developed; and the client software, the "wallet," needs to be integrated into Web browsers in order to be easy enough to use.

To give SET its due, it has several significant achievements to its credit. SET works in demonstrations and is being implemented in trials. Most of the relevant software vendors, merchant banks and credit brands have endorsed it. A crowd of vendors including Microsoft, VeriSign, Netscape, IBM, Visa, MasterCard, CyberCash, Inc. and others, all of which previously were proposing proprietary online credit card transaction systems, now all support a standard — SET.

This achievement of consensus is no small feat. As Herz points out, "At 'The Promise of SET' event [in late July], we had 18 software vendors demonstrating products that include SET capabilities. This is 18 vendors who before were quoting a date. Now they're demonstrating."

Still, detractors say the system is cumbersome and hard to understand. All the SET software produced by different vendors will have to be authenticated with certificates keyed to a root

Go online to learn more about SET. We've built links to resources including:

- Visa's site, which includes all kinds of SET background info and downloadable copies of the SET 1.0 protocol. (Other than press releases, MasterCard seems to have far less SET info, or at least any we could find.)
- RSA Data Security's SET Central site, which has details about the RSA security algorithm included in SET.
- The CommerceNet site, where you can check out archives from mailing lists about SET and electronic commerce, most notably "SET-discuss," or sign up to join one or more lists.



www.nwffusion.com

certificate, based on SPYRUS/CertCo technology, that is guaranteed by Visa and MasterCard. Each bank that wishes to issue certificates will have to become a certificate authority or outsource to one. Each merchant bank will have to build a SET gateway or outsource to a company providing one. And every user of SET who wishes to take advantage of it will have to get a certificate for each credit card to be used and transact with an online merchant who also has been certified for SET compliance.

Putting all of these steps in place means time and money, at the same time that doubts are still being cast on the system. So the discussion naturally turns to alternatives.

The smart card

The alternative mentioned most often is the smart card, a credit card-sized plastic card with a computer processor embedded in it. Coupled with a smart card reader and perhaps a communications network, the card takes on all kinds of functions.

It can be a "cash card," onto which value can

be deposited, to be used for specialized purchases such as telephone calls or more general purchases, instead of cash. A properly designed smart card also can be used like a credit or debit card. For example, plans for Version 2.0 of the SET specification are expected to include SET software that can be used on smart cards to enable credit card transactions.

Visa and MasterCard have announced projects involving smart cards. Last spring, MasterCard bought a majority interest in Mondex International, Ltd., a leading vendor of multipurpose smart cards. Sun Microsystems, Inc. this summer announced that a version of its Java computer language is being developed for use on smart cards. Tens of millions of smart cards are already in use outside the U.S., largely for telephone calls and other specialized purposes, but increasingly they are being used for more general cash transactions. The more general uses are expected to increase.

Smart cards, moreover, are touted as being more secure and less complicated than SET. Theoretically, a consumer at a PC with a smart card reader attached could carry out an encrypted transaction with a merchant. The card's physical existence in the reader would authenticate the user, not just the PC. Smart cards require a password to operate, and attempts to hack the password are said to render the card useless.

One supporter of smart card technology has even begun to accuse the credit card companies of intentionally delaying their implementation. "SET is a scam," says Jerome Svigals, a former IBM employee who worked on the original magnetic stripe technology and is now a consultant in Redwood City, Calif. "In 1987, a study by Booz, Allen & Hamilton, Inc. said that if Visa and MasterCard, which are service companies and derive their revenues from electronic authorization, switched to smart cards, they would lose 86% of their revenue. When they got the report, the companies swore they would never voluntarily move to smart card credit cards," Svigals says. "They put steps in place to delay smart card credit cards."

Visa and MasterCard, naturally, dispute such claims. Herz says you have to look at the logic behind the SET vs. smart card choice in terms of numbers. "Current estimates put 60 million people with access to the Internet. How many have a chip card reader? Not very many. Shall we say, 'Let's just wait until we have a card reader?' What would the retail cost of a card reader be? How long would it take 60 million people to deploy that technology on their PCs? We'd also have to deploy the smart cards."

By contrast, users will be able to download SET software and certificates from various providers' Web sites, he says. "We need to get something onto the Internet as soon as possible to support a growing marketplace," he says. "Then as technology evolves and advances and allows us to evolve into a chip card-based marketplace, we can evolve as well, but not by leaving people in the dust."

CyberSource's Klebe, a 20-year veteran of the financial technology industry, puts it slightly differently but comes to the same conclusion: "We've just finished the major movement to magnetic stripe card readers at every point of sale. Getting merchants to be willing to accept throwing those away to put in smart card-capable terminals would

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be a hard sell. It would cost billions of dollars."

But Klebe also points out that the greatest revenues in the credit card industry, by far, come from revolving-credit interest. If smart cards or other technologies provided the opportunity

to make online payments with cash, a bank's interest in promoting the technology might be less than enthusiastic because no revolving-credit interest payments could be generated.

"If it's good for the issuers of credit cards, it will happen. If it's only good for

the merchant side of the business, it won't happen," Klebe says.

The bottom line

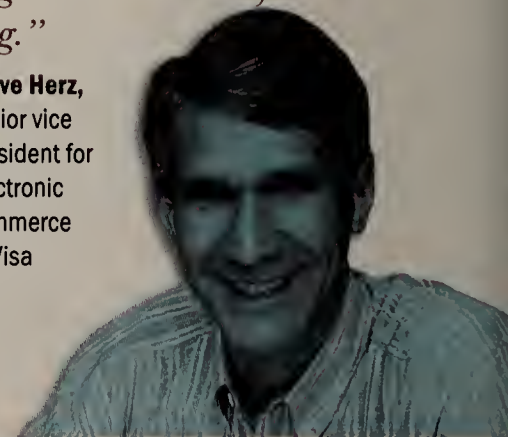
Another alternative is to continue with the status quo. Many consumers already are using credit cards on the Internet.

That number is expected to grow, thanks to companies such as CyberSource that offer specialized methods to detect credit card fraud. The basic channel through the Internet can be made secure with Netscape's Secure Sockets Layer technology, even though the transaction is not authenticated. Merchants then can add security methods such as those CyberSource offers.

CyberSource, Klebe says, also will support SET. Vendors such as Viaweb, Inc. will probably stay with the status quo until significant numbers of consumers or vendors demand SET or some alternative.

[In late July] we had 18 software vendors demonstrating products that include SET capabilities. This is 18 vendors who before were quoting a date. Now they're demonstrating."

Steve Herz,
senior vice
president for
electronic
commerce
at Visa



The momentum is for progress beyond the status quo lies with SET. Major implementations of multipurpose smart card systems are seen as being years away because of the costs of readers, if not cards. Most smart card action is outside the U.S., often because the cost of phone lines make credit card authorization systems such as those in the U.S. too expensive. Here, most smart card initiatives are for more limited roles involving specialized purchases, frequent customer plans or physical security measures such as building entry.

In short, no other online transaction system promising improved security has anything near the consensus support that SET has generated. All this points to SET being the only viable alternative close to implementation in the U.S. today.

The SET committee is working on Version 2.0 for smart cards, which is expected to be available in 18 months or less. If SET moves very slowly, it's possible smart cards could overtake it. More likely, some future synthesis will appear. The future is not yet SET, but in the near term, despite all its complexities, it's the best bet.

Haight, formerly the editor of CMP Media's NetGuide magazine, wrote this story during his brief stint as a freelance writer. He has since become editorial director, Conferences for Fawcette Technical Publications in Palo Alto, Calif. He can be reached at thaight@fawcette.com.

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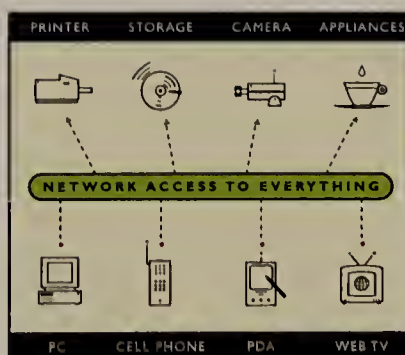


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GroupWise gets wiser

Continued from page 1

Internet Message Access Protocol (IMAP) and Lightweight Directory Access Protocol (LDAP). And while the existing Web Access client was already considered to be quite good, Novell rewrote it, incorporating the power of HTML 3.2 and Java to give it the look and feel of the native 32-bit client.

GroupWise also sports a much-improved Workflow tool that allows more complex office tasks to be automated. There is now native client support for Macintosh and three Unix platforms, as well as server-side message transfer, administration and post office agents. Top that off with the GroupWise Monitor snap-in that allows ManageWise to watch and maintain your system, and you have a package that's bursting at the shrink-wrap.

First among the new services GWIA supports, POP enables a user to briefly connect to a mail server and download new mail. While it is a popular protocol, POP treats the server as one large store, retrieving new messages en masse, without regard for where they originated. Most POP clients let you categorize messages in folders once they are downloaded, but they lack the enterprise features of GroupWise.

Novell paid close attention to performance and reliability in its implementation. GroupWise now is able to quickly retrieve hundreds of new messages at a time to the POP client of your choice. We tried many clients and found the service to be rock solid with good performance.

As mail clients become more sophisticated, POP is giving way to IMAP. IMAP clients have the ability to use and manipulate the folder functions found in GroupWise and other mail server packages. Novell's IMAP gateway complies with RFC 1777, the IMAP Version 4.1 specification. It also complies with the most popular packages that support IMAP, most notably Netscape Communications Corp. and Microsoft Corp. clients. Because IMAP is relatively new, some client packages have a bit more trouble supporting it. For example, the University of Washington's PINE client and ESYS Corp.'s Simeon had to be coaxed into finding the GroupWise folders, but they worked fine after that.

Another new feature provides directory services to those outside your GroupWise system. The LDAP service in GWIA references a GroupWise post office database. Among the many parameters you can set for the LDAP service are the number of entries a query will return, authentication required to perform a query and the fields

returned. With the service running, any user — including those not in your GroupWise system — with an LDAP-enabled client can point to GWIA and ask it for GroupWise addresses.

The service builds the proper Internet addresses for mail delivery by using the SMTP address of GWIA itself or a post office gateway alias. A gateway alias allows each post office in your GroupWise system to appear to have its own SMTP address. For example, suppose each department in your organization acme.com wants its own address. Using a gateway alias for each post office, you can have addresses of mgmt.acme.com, acct.acme.com, engr.acme.com and so on. As long as your domain name service has a Mail Exchange record for each of the aliases pointing to GWIA, you can have several "virtual hosts" receiving mail through one GWIA gateway.

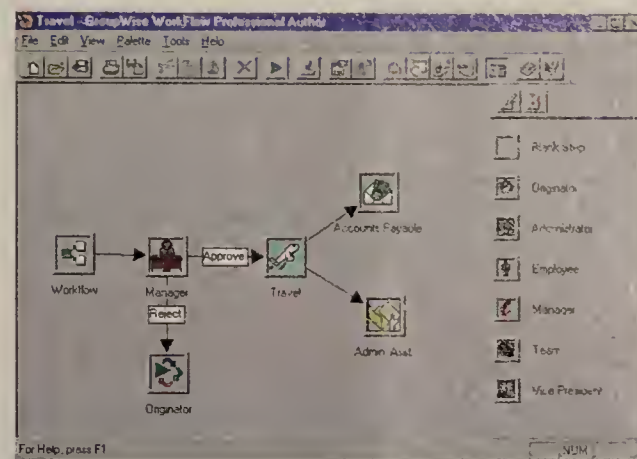
Putting it all together, if someone makes an LDAP query "Jones," he could receive bjones@mgmt.acme.com, sjones@acct.acme.com and jonesie@shipping.acme.com, along with other information of your choosing.

Even on our slow 33-MHz 486-based test server querying more than 6,000 accounts, the LDAP server drilled down to names almost instantly. In short, GWIA lets you provide an e-mail directory to the outside world if you choose.

Novell has added the capability to use the SMTP gateway with a dial-up service provider. GWIA can be configured to dial your Internet service provider at set intervals to retrieve and send new mail or deliver new mail as soon as it is queued.

Web Access, the Web interface for GroupWise, has been given a total face-lift. With its multipane interface, Web Access bears a strong resemblance to GroupWise's 32-bit native desktop appearance.

Novell has added features to Web Access, such as the ability to send up to three attachments per



Workflow Professional can create a travel request with conditional branching to all parties involved.

message. It includes Java applets for calendar and address book interfaces. But Web Access still lacks three features found in the native client: the ability to proxy into another account and "become" that user or resource; access to the Trash (in case you want to access deleted items not yet purged); and access to the user's personal address book, though users do have full access to the system address book and public groups. Of course, not everyone you communicate with is listed in the system address book, so we hope to see the personal address book in a future version. But on the plus side, Web Access includes full access to GroupWise's document management system and libraries.

GroupWise server installation has been streamlined such that it's almost foolproof. A new installation of the basics or an upgrade from Version 5.1 takes a matter of minutes. Converting from Version 4.1 requires database conversions and adds time to the process proportional to the size of your GroupWise system.

Clients keep current

GroupWise clients also got a little polish in this release. The 16-bit version was streamlined, making it faster and more crash-resistant, but it looks the same. With the 32-bit client, you can now author workflows, which are tasks automatically routed from person to person or to a group until

Net Results

	PROS	CONS
GroupWise 5.2 Novell, Inc. (800) 453-1267 (801) 429-7000 www.novell.com/groupwise From \$718 for a five-user license to \$32,625 for a 250-user license	▲ Native support for Unix clients and agents ▲ Enhanced document management ▲ Java/HTML3 Web Access ▲ POP-, IMAP- and LDAP-compliant ▲ Workflow Professional for office automation ▲ GroupWise Monitor aids in network management	▼ Moderate learning curve for Workflow Professional ▼ GroupWise Monitor requires ManageWise

Score Card



	Administration (20%)	Connectivity (20%)	Features (20%)	Scalability (20%)	Upgradability (10%)	Installation (5%)	Documentation (5%)	Total score
GroupWise 5.2	9 x .20 = 1.8	9 x .20 = 1.8	10 x .20 = 2.0	10 x .20 = 2.0	10 x .10 = 1.0	10 x .05 = 0.5	8 x .05 = 0.4	9.5

Individual category scores are based on a scale of 1-10. Percentages are the weight given each category in determining the total score.

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they are completed. The author can check the status of the workflow to determine who has finished and who is holding it up.

With the standard client, each workflow is created ad hoc and cannot be saved in order to be launched again. However, included with Version 5.2 is a tool called Workflow Professional that

can be installed with the 32-bit client. This tool enables you to create and save more complex workflows (see figure, page 53). They can be retrieved to be used as templates via the document management system. Automatically launching an application and providing a fully customizable list of responses are only a few of Workflow Professional's

capabilities. It takes a little effort to understand how to create a complex workflow, but the application is a powerful tool that can be used to automate many common office tasks.

The attachment-viewing capabilities of the 32-bit client have been reworked. A new viewer supports up-to-date versions of most popular file formats and provides

the ability to accurately print images.

At long last, Novell has released a native client for the Macintosh, which supports Motorola, Inc. and PowerPC architectures. The Macintosh client includes most of the features of the 32-bit Windows client and worked well on both architectures and on the MacOS 7 and 8. Overall, it is a welcome addition to the family. Novell also provides clients for three popular flavors of Unix: Solaris (which we tested), AIX and HP/UX. The Unix clients have the functionality of the 16-bit Windows client and are X-based applications.

Novell apparently is serious about its claim to put GroupWise on many server platforms other than NetWare. Included in Version 5.2 are agents for the same three implementations of Unix. By using these agents, it is possible to put an entire post office or domain on a Unix system. How-

ever, this release requires a Network File System (NFS) connection to transfer administrative changes. Most standard Unix

implementations only include TCP/IP, so NFS might be an additional cost. If this is the case for your site, remember that you don't need the Unix agents to use the Unix clients.

The final piece of the 5.2 puzzle is a new feature called GroupWise Monitor. It is an add-on to Novell's ManageWise package that uses SNMP to monitor which agents are working and the problems afflicting those that aren't.

As far as upgrades go, Version 5.2 is a no-brainer. The added accessibility features provided by GWIA and the new Web Access alone make it worth the price. For those with Unix platforms, a new avenue has been opened. And if you're looking for more office automation tools, Workflow Professional can help you out.

Berkley is the supervisor of LAN Support Services at the University of Kansas, where he administered a GroupWise implementation of more than 4,000 users. He can be reached at berkley@ukans.edu.

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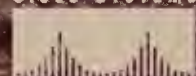
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To test the services provided by GroupWise Internet Access, we used the following packages on various platforms:

- Netscape's Navigator and Communicator
- Microsoft's Internet Explorer and Internet Mail
- David Harris' Pegasus Mail
- ESYS's Simeon
- University of Washington's PINE
- CE Software's QuickMail



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REVIEW

WEB SERVER LOAD BALANCERS BOOST RELIABILITY AND PERFORMANCE; CISCO'S LOCAL DIRECTOR DOES IT BEST.

Distributing the Web load

By Rich Farrell

D imagine if your Web site were like a supermarket checkout, and your customers always got in the slowest cashier's line. Before long, they'd grow frustrated and go elsewhere. But there are ways to build Web sites so everyone quickly gets what they came for. The secret is balancing the load to multiple Web servers, ensuring continued service. We looked at four load-balancing devices that enable you to split traffic over several machines, add and remove machines dynamically, and evaluate the relative capabilities and capacity of a machine before assigning traffic to it.

We tested Cisco Systems, Inc.'s Local Director; F5 Labs, Inc.'s BIG/ip2; RND Networks, Ltd.'s Web Server Director Pro; and HydraWEB Technologies, Inc.'s HydraWEB Load Manager. All of the products were good, and each one had features that made it suitable for particular network configurations. However, the full suite of redirection algorithms and the administration capabilities of Cisco's Local Director put it at the top of our list.

While none of the products are inexpensive, one may be better suited to smaller server farms than the others. HydraWEB is the only company that prices its product according to the number of servers it is balancing. A minimal configura-

tion of four servers costs \$7,990, or \$12,980 for a redundant configuration.

Many similarities

All the products balance traffic consisting of standard TCP/IP protocols, including User Datagram Protocol (UDP), HTTP and Secure Sockets Layer (SSL). Likewise, they all support 10Base-T and 100Base-T networks, and all but Web Server Director support FDDI. Because they are based on a Unix kernel, BIG/ip2 and HydraWEB can use many existing Unix utilities, making them potentially more flexible than the others.

None of these load-balancing devices should

cause a performance bottleneck because their rated capacity goes well beyond the maximum physical load they can support (see table, page 58). For Web sites that run on 10M bit/sec networks or have slower Internet connections (T-1, for example, is 1.54M bit/sec), the most important factors in choosing one of these products are failover features, administration, security, monitoring and cost. It's also wise to look for the ability to balance traffic by port and reconfigure supported servers on the fly.

The products we tested publish a virtual IP address that looks like a single physical machine to network clients for each server farm they support. As clients send traffic to the virtual address, the load-balancing devices redirect the requests to any number of servers. In cases in which the machines support more than one virtual IP address (and thus multiple domain or machine names), the redirected traffic may be sent to different back-end machines for each virtual IP address or to different ports on the same machines.

TCP/IP-based protocols use ports to "listen" for incoming traffic. On a Web server, port 80 is the default port on which the server expects to receive traffic from a Web client. Thus HTTP requests that specify only a host name and not a port (as in www.server.com) are handled by port 80. However, you can specify any port from zero to 65536 (as in www.server.com:9000).

All of these load balancers except BIG/ip2 can map incoming requests to a port other than port 80. With port mapping, you can equate port 80 in a virtual IP address to any other port of a Web server. This allows services to advertise a catchy domain name rather than the more complex name of the server that's actually fulfilling requests.

Unlike the others we tested, BIG/ip2 doesn't allow port redirection and, therefore, can't support multiple domain names for HTTP and other protocols. BIG/ip2, however, can enable or disable inbound traffic by port. For example, you can allow only HTTP on port 80 and only File Transfer Protocol on port 25.

A load balancer uses one of several algorithms to choose which Web server is best suited to handle a given request. Redirection algorithms used by the various products range from simple round-robin distribution to monitoring the num-

ber of active connections or even monitoring the system loads of the Web servers (see story, page 58). Local Director supports the broadest range of redirection algorithms, but it doesn't have an algorithm that runs a process on each of the real machines to directly assess the viability of the machines. Only HydraWEB has this feature.

Fallover performance

Because these devices are designed to improve system performance and reliability, they must be reliable themselves. To address that, each supports

Score Card

	Load balancing (20%)	Flexibility (20%)	Fault tolerance (20%)	Management and administration (10%)	Security (10%)	Remote access (10%)	Installation and documentation (10%)	Total score
Local Director	9 x .20=1.8	9 x .20=1.8	9 x .20=1.8	8 x .10=0.8	9 x .10=0.9	9 x .10=0.9	9 x .10=0.9	8.9
WSD Pro	8 x .20=1.6	9 x .20=1.8	8 x .20=1.6	9 x .10=0.9	9 x .10=0.9	9 x .10=0.9	8 x .10=0.8	8.5
BIG/ip2	7 x .20=1.4	10 x .20=2.0	7 x .20=1.4	9 x .10=0.9	10 x .10=1.0	9 x .10=0.9	9 x .10=0.9	8.5
HydraWEB	9 x .20=1.8	10 x .20=2.0	7 x .20=1.4	7 x .10=0.7	9 x .10=0.9	9 x .10=0.9	7 x .10=0.7	8.4

Individual category scores are based on a scale of 1-10. Percentages are the weight given each category in determining the total score.

failover to a second identical device. Local Director, BIG/ip2 and HydraWEB provide failover by connecting two load balancers via a serial cable. Loss of one of the units is noticed by the other, and failover occurs automatically. Instead of a physical cable, Web Server Director broadcasts preferred routing instructions to the virtual IP addresses with secondary routes for failover situations, making it more fault-tolerant than the others.

What happens when the serial cable fails? With BIG/ip2 or HydraWEB, each

TABLE 1: STATED THROUGHPUT

Product	Throughput
Local Director	92M bit/sec
HydraWEB	80M bit/sec
BIG/ip2	45M bit/sec
WSD Pro	45M bit/sec

of the two devices assumes primary control. This is a highly undesirable situation that would leave your Web site unavailable until the cable was replaced and the systems recovered.

Cisco says when Local Director detects the failure of its cable, machines will not failover but generate SYSLOG messages about the failure. Standard monitoring of SYSLOG could detect this situation, and Local Director will continue to function until one of the boxes fails.

Each of the devices supports detection of failed Web servers behind the redirector device. In our tests, they all routed

traffic to the remaining servers, avoiding the failed one.

For this kind of failure, HydraWEB recovered in our testing within 10 seconds, BIG/ip2 in under 15, Web Server Director in less than 20 and Local Director in 45 seconds.

Both Web Server Director and HydraWEB allow nondedicated servers to be configured as backup machines, taking over Web server duty when another machine goes out of service.

Maintaining state

Protocols such as FTP or SSL require all of a single client's packets in a single session to be continually handled by the same server. In order for this to happen, the load-balancing devices must maintain a table of this state information — IP addresses and source ports as well as destination and destination ports used. This information remains in the devices' memory for a configurable period of time. If the protocol being transferred does not require state, all the devices except RND's Web Server Director can

Net-Results

	PROS	CONS
Local Director <i>Cisco Systems, Inc.</i> (800) 553-6387, (408) 526-4000 <i>www.cisco.com</i> \$64,000	▲ Allows port mapping ▲ Has the most options for distributing traffic loads ▲ Allows servers to be brought online gradually	▼ Nongraphical interface
BIG/ip2 <i>F5 Labs, Inc.</i> (888) 882-4447, (206) 447-1817 <i>www.f5.com</i> \$37,000	▲ Graphical management interface ▲ Provides security for real servers ▲ Redundant power supplies	▼ Cannot directly access Web servers through the device for administration ▼ Doesn't balance by port
Web Server Director Pro <i>RND Networks, Ltd.</i> (888) 234-5763, (201) 512-9771 <i>www.rndnetworks.com</i> \$28,000	▲ Graphical management interface ▲ Can distribute traffic anywhere on the network ▲ Redundancy obtained without serial cable ▲ Allows port mapping	▼ Current release requires always keeping state
HydraWEB Load Manager <i>HydraWEB Technologies, Inc.</i> (800) 767-8649, (212) 809-5900 <i>www.hydraweb.com</i> \$25,990 (eight servers)	▲ Allows port mapping ▲ Lowest cost ▲ Supports hot spare Web servers ▲ Per-Web-server pricing plan ▲ Redundancy obtained without serial cable ▲ Allows servers to be brought offline on a schedule	▼ Supports e-mail, SYSLOG and pager alerts ▼ Complex system configuration (easier for NT clients than Unix)

Price is for a redundant configuration of two devices.

be configured to not maintain the table of addresses and to let traffic go to different machines each time. RND says it plans to add that functionality.

Local Director allows you to configure the timeout value separately for each virtual server and port. Web Server Director allows the timer to be dropped to 1

Load-balancing algorithms

There's more than one way to balance traffic load across multiple Web servers.

Rotary Domain Name System (DNS) is an older technique that these devices replace. If you're using rotary DNS for load balancing, consider the devices reviewed here for improved performance and fault tolerance.

Rotary DNS is a way of modifying DNS entries so entries for a virtual name can service requests for multiple machines. Machines move to the head of the list one by one in a round-robin fashion. If there are three machines listed for a given virtual name, the order of the three will be switched periodically so some of the requests will see one machine as the preferred translation for a name, other requests will see the second, and still others will see the third.

Because standard DNS is used by rotary DNS, it is not possible to predict and control client caching, nor, therefore, the actual load on the servers. Adding and removing machines can take many hours as DNS changes are propagated through the network, and a lot of traffic could be sent to a machine that has been removed for hours or even days. Rotary DNS changes the IP address associated with a virtual site — it does not have any effect on which protocols or ports can be used with that address.

Employing dedicated load-balancing hardware offers many advantages over rotary DNS. Because the load-balancing devices map incoming requests to real servers and traffic passes through them to and from the real servers, a count of open connections can be established.

Round-robin load balancing treats all servers as equal, similar to rotary DNS but without propagation delays or caching issues. Web farms with several devices all configured in a similar fashion and all of the same capacity will find round-robin to be a predictable, efficient algorithm.

Least connections is useful when servers in the Web farm are not of the same capacities (smaller/slower vs. larger/faster machines) or are running different software. Connections take longer on slower machines, so as the number of outstanding connections increases, traffic migrates to machines with fewer connections.

Because not all real machines in a Web farm are necessarily equal in capacity or in the tasks they can perform, system managers may need the ability to assign "weights" to each machine, giving the load-balancing

SUPPORTED CONNECTION METHODS

	Round robin	Least connections	Weighted percentages	Fastest	Maximum connections	Server daemon monitoring
Local Director	✓	✓	✓	✓	✓	
BIG/ip2	✓		✓			
WSD Pro	✓	✓	✓			
HydraWEB	✓		✓			✓

device hints as to how to balance the traffic. Weighted percentage lets you affect how the servers are assigned proportions of traffic by percentage. This gives the system administrator the ability to favor one machine over the other rather than relying completely on the load-balancing software to figure out the inequities of the various machines in the server farm.

The load-balancing algorithm known as fastest keeps track of the length of time a machine takes to fulfill a request and refers traffic to the server with the fastest response rate.

Maximum connections can be used to ensure machines don't go above thresholds that are deemed to be the maximum desired.

With server daemon monitoring, each real machine runs a daemon process that the load-balancing machine pools to ascertain the relative health and capacity of the real machine. This algorithm only works with Unix and Windows NT Server operating systems.

—Rich Farrell



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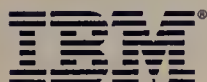
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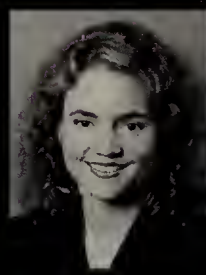
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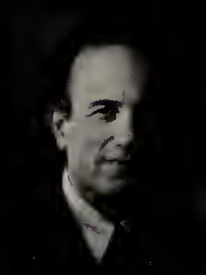
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second and in a future release, will allow it to be set to zero, indicating it's not to be used.

Systems administration and monitoring

In an active server farm, machines can be added and removed, or brought offline for maintenance. Load-balancing devices aid in this process, redirecting traffic destined for specified IP addresses and protocols as necessary. However, the administration interfaces of the machines can be quite different.

All of the devices support large numbers of servers, which should be sufficient for any Web site. Local Director supports 10,240 virtual and real IP addresses; BIG/ip2 supports 255 virtual and real hosts, though the soon-to-be-released Version 1.7 is scheduled to support unlimited numbers of real and vir-

tual hosts; Web Server Director supports more than 50,000 real machines and 500 virtual addresses; and HydraWEB supports unlimited varieties of both.

Local Director has a command-driven interface for maintenance and monitoring and can be administered via telnet. Configuration is straightforward, with just a few commands required to get online.

BIG/ip2 can be managed via telnet and an RS-232 console. Being Unix-based, it can be monitored using standard Unix tools. The virtual hosts are the names and IP addresses published to the Internet, from which the load-balancing devices redirect traffic to one or more real devices that service the requests. BIG/ip2 provides an easy-to-use graphical interface that supports Data Fellows, Inc.'s SSH encryption and is

expected to release an X Window interface soon as well.

Web Server Director has the easiest and most intuitive systems administration interface and load-monitoring utilities. You can manage the device remotely using a graphical interface on a PC or via a console session.

Web Server Director is accessed via a graphical client. Initially, we used the console port to configure Web Server Director and to enable some IP addresses for the graphical client. We finished our configuration with the graphical user interface. Web Server Director can distribute traffic to remote servers anywhere on the Internet, while the other products only distribute traffic

You'll find more load-balancing info on Fusion:

- A software-based alternative to the hardware devices reviewed here
- A tool for remotely managing your load balancer
- A white paper on the SSH encryption protocol

www.nwfusion.com



to servers on the local LAN.

HydraWEB has in-depth configuration options but the most technical of all interfaces. We could reach HydraWEB by telnet, but for security reasons, we recommend using one of the remote logon options, such as dial-up or a remote console, attached to the serial port.

HydraWEB also notices whether a machine or one of its ports has stopped responding. HydraWEB supports a virtually unlimited number of servers, although licensing costs are less for small numbers of servers. Along with standard Unix tools for monitoring the device, HydraWEB has built-in facilities for e-mail and pager monitoring.

Accessing HydraWEB through an RS-232 port using its Proconsul interface lets you modify the local system, and Proconsul can be utilized with remote console devices. HydraWEB's shell access includes administrative services for managing HydraWEB and viewing system state. We also could set up accounts to allow nonprivileged users to monitor the device.

Security vs. access

All of the physical devices employ some level of security for the machines they load balance.

BIG/ip2 and HydraWEB, being Unix-based products, allowed Unix-based security with products such as Free BSD S/Key or Security Dynamics Technology, Inc.'s SecurID. BIG/ip2 performs several firewall functions, such as IP and port control list, acting as a choke point to keep the servers behind it invisible to the external network. HydraWEB also supports dial-up.

Some Webmasters may wish to hide their web servers so their IP addresses and names are not published and the machines can't be accessed via telnet or ping. Other sites may want individual machines to be available directly by name or address for monitoring purposes or to make it easy to connect to individual machines.

Of the devices we tested, only BIG/ip2 never allows individual machines to be available to the network. HydraWEB normally is configured so the addresses of managed servers are hidden from the external network, but this is not required.

Farrell is the technology manager at Boston Globe Electronic Publishing, where he is responsible for technology, performance and reliability for the www.boston.com Web site. He can be reached at farrell@globe.com.

Merrill Lynch checks out Local Director

By Dean Albano, Nichole Costa and William Rickvasky

Editor's note:

While we were assembling this review of Web traffic redirectors, we received an e-mail from Andy Surany, vice president of distributed architecture and performance engineering at Merrill Lynch & Company, Inc. His group had just completed a test of Cisco Systems, Inc.'s Local Director, and he was wondering whether we'd be interested in the results. "Uh, sure," we responded, thinking quick on our feet. "Send 'em on up." What we received was an impressive document that shows Merrill Lynch knows a thing or two about testing. We've summarized the findings here and posted the full version on Network World Fusion.

The objective of our tests was to analyze the performance of Cisco Systems, Inc.'s Local Director Version 1.6 with respect to:

- Latency associated with each of the predictor algorithms provided
- Failover capabilities
- Performance at speeds greater than 45M bit/sec, which is Cisco's advertised capacity

Our test lab consisted of a mix of Intel Corp. Pentium workstations and servers, all configured with Windows NT Server 4.0 (Service Pack 3). The servers also were configured with Netscape Communications Corp.'s Enterprise Server 2.0 Web server software. Workstations and servers were connected to separate virtual LANs on a Cisco Catalyst 5000 Ethernet switch, which were, in turn, connected by the Local Director.

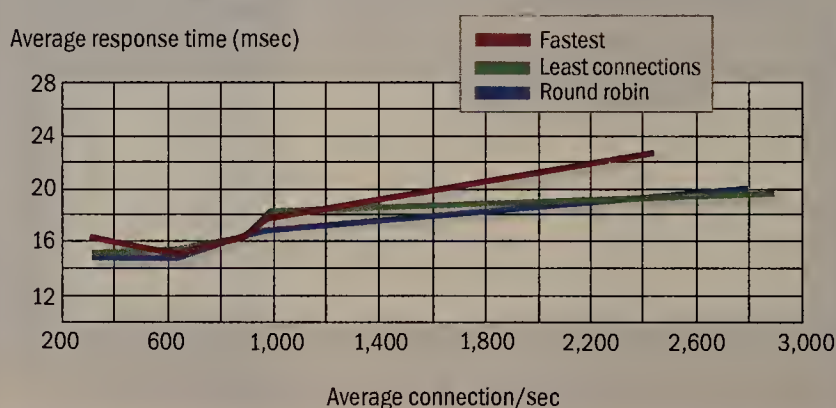
We began by establishing a configuration baseline without Local Director. Local Director was then inserted into the network to act as a load distributor.

Based on Cisco's recommendation for best performance, we tested the latency of Local Director using three of the four algorithms provided: least connections, fastest and round robin.

The baseline environment indicated a non-Local Director maximum connection rate of 2950 connections per second. The least connections algorithm was able to establish the most connections per second: 2,970, using 70% of the available 100M bit/sec bandwidth. The round robin algorithm forged 2,850 connections per second, using 67M bit/sec of bandwidth. The fastest algorithm came in at 2,500 connec-

ALGORITHM PERFORMANCE CURVES

Performance curves for each of the predictor algorithms show they have equal statistics at the lower levels, but at about 1,600 connections/second, the fastest algorithm begins to perform worse than the other two.



tions/sec, using 60% of bandwidth. (See story on page 58 for more details about these algorithms).

The fastest algorithm appeared to focus on two of the three servers; CPU utilization on those two servers reached more than 90%, while the third was considerably lower (see graphic).

In terms of failover capabilities, Local Director performed well. The first failover involved physically removing a server from the network, and the second involved manually stopping the Netscape server process during a test run. In both scenarios, Local Director took about 3 seconds to recognize the server failure and redirect all transactions to remaining servers. It also recognized when the servers were brought back into the network and started to direct transactions to the servers once again.

And Local Director turned in better than expected performance. Cisco states Local Director should be able to handle data at up to 45M bit/sec with no performance degradation. We pushed data at Local Director at speeds of 70M bit/sec with only minimal degradation — and no failure.

Albano is a senior network engineer, and Costa and Rickvasky are senior performance engineers at Merrill Lynch.

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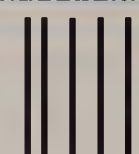
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Frame Relay offers companies the chance to increase network performance while decreasing their costs of operations. As a result, frame relay has become the fastest growing data service in the industry and is only matched by the growth rate of the Internet. In fact, according to the 1997 *Network World* 500 survey, over 74% of leading network IS professionals at the largest U.S. companies have already implemented or plan to implement frame relay to give them efficient and effective wide area communications.

Frame Relay '97 will help you decide whether frame relay is the right service for your company and you will learn what benefits you can expect from implementing a frame relay network. In addition, this seminar, taught by frame relay expert Tom Jenkins of TeleChoice, Inc., will explore which applications perform well on a frame relay network and which carriers and equipment vendors you need to consider in your evaluation process.

If you have already implemented a frame relay network, attending this information packed one-day seminar will educate you about the new features and services available in the market and how they can benefit your company.

Whether you are a network/telecom planner, manager, designer or administrator, **Frame Relay '97** will provide you with the information and insight necessary to more efficiently and effectively implement, expand and manage your network.

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- Exclusive Network World Frame Relay Resource CD-ROM
- Luncheon and break refreshments
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Note: If you can't attend, call us and order this informative and useful attendee materials kit for just \$99!

12 Key Benefits of Attending

1. Explore the inherent benefits of using frame relay
2. Learn when frame relay is a more economical solution than other service options
3. Understand the benefits and limitations of NNI connections
4. Discover which frame relay service features are significant and which are merely hype
5. Gain an understanding of the direction of the frame relay market
6. Analyze the differences between the major frame relay providers
7. Learn how to save money by consolidating your voice and data applications over frame relay
8. Understand the alternative approaches to running SNA applications over frame relay
9. Learn how pricing structures differ among carriers and how to take advantage of these differences to obtain the best service bargain
10. Analyze case studies of various network types to see how frame relay can be best implemented
11. Understand what network management options are available and the pros and cons of outsourcing vs. in-house network management
12. Learn about new and likely future service enhancements which could impact your network

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Keeping up with change in this industry at times is like trying to outrun a tsunami.

And staying ahead of all the activities at NetWorld+Interop 97 can be akin to staying ahead of that huge wave.

That's why we've come up with this easy-to-follow planning guide. Here you'll find the hottest sessions, most important keynotes and other valuable events worth attending at the big show.

So grab your guide and we'll see you in the water.

SAFE AND SECURE

Interop will hold its inaugural Security Symposium Oct. 9 to 10. The symposium will immerse attendees in all aspects of security from firewalls to disaster recovery.

THURSDAY, OCT. 9

features seven sessions:

- Security on Internet Time, 10:15 a.m. to 11:45 a.m.
- 3D Non-Stop Networking: Disaster Recovery, Data Center Mirroring, Diversity, 10:15 a.m. to 11:45 a.m.
- Trusted Services and Key Escrow Recovery, 2 p.m. to 3:30 p.m.
- Making the Internet More Secure, 2 p.m. to 3:30 p.m.
- The Many Faces of Virtual Private Networks, 4 p.m. to 5:30 p.m.
- Border Services and Network Security, 4 p.m. to 5:30 p.m.
- The Future of Internet Security, 6 p.m. to 8 p.m.

FRIDAY, OCT. 10

sessions continue with:

- Firewalls Aren't Enough, 10:15 a.m. to 11:45 a.m.
- Defenses Against the Top 10 Security Threats, 2 p.m. to 3:30 p.m.
- Securely Integrating SNA and Web Browsers, 4 p.m. to 5:30 p.m.

NetworkWorld

INTEROP

NETWORLD+INTEROP 97

PLANNER

OUR PICKS

Monday/Tuesday

October 6-7

Two-day Tutorials

Monday and Tuesday, 9 a.m. to 5 p.m.

DESIGNING, BUILDING AND MANAGING SWITCH AND ROUTER-BASED DATA NETWORKS

Scott Bradner, director of the Harvard Network Device Test Lab, will discuss the evolution of network design from SNA to Gigabit Ethernet and bridged LANs to switch-based intranets.

Monday and Tuesday, 9 a.m. to 5 p.m.

FUTURE LAN TECHNOLOGIES: HIGH-SPEED, SWITCHING AND VIRTUAL LANS

Learn about current and upcoming LAN technologies and the best way to migrate from your present system. Dr. Peter Tomsu, a consultant with Cisco Systems Europe, will go over Layer 2 and 3 and multilayer switching as well as how to optimize the efficiency of an enterprise internetwork.

Monday and Tuesday, 9 a.m. to 5 p.m.

THE DOMAIN NAME SYSTEM & INTERNET NAMING AND DIRECTORY SERVICE

Curious about what creates and resolves names for hosts, mail routing and Web URLs on the 'Net? Look no further. This tutorial led by Dr. Paul Mockapetris, chief technology officer at Software.com, will review the theory behind DNS and demonstrate how to install and configure the technology.

Seminars

Part A: Monday 9 a.m. to 12:30 p.m. Part B: 1:30 p.m. to 5 p.m.

INDUSTRY 101 — VOICE OVER IP

Lend your voice to the dialogue about Internet telephony. This seminar covers the history of voice over IP, regulatory issues, standards and interoperability and the 'Net resources available. The seminar is led by Jeff Pulver of pulver.com, Inc.

OUR PICKS

Wednesday

October 8

10:15 a.m. to 11:45 a.m.

NEXT-GENERATION EDGE SWITCHES

If you're on the network edge, it's time you learned about how to deploy multiservice switches to create an industrial-strength Internet infrastructure. Susan Almeida of the Strategic Networks consultancy leads the session.

2 p.m. to 3:30 p.m.

WEB-BASED AND JAVA MANAGEMENT

Network management has become a battle between the Web-based Enterprise Management from Microsoft and the Java Management API from Sun. Is either camp really helping users do anything?

4 p.m. to 5:30 p.m.

DEPLOYING WEB SERVER FARMS

Today's Web technology requires IS managers to perform a balancing act. Learn how to distribute your Web workload based on the farm paradigm.

Workshops

9 a.m. to 5 p.m.

PRACTICAL NT INTRANETS

Just the facts, ma'am. Find out about the choices available with the new NT-based Internet/intranet products from Microsoft. Learn about performance, security, management strategies and commercial integration.

9 a.m. to 5 p.m.

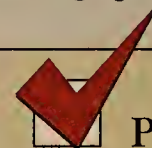
NOVELL BORDER MANAGER: PROXY SERVER, GATEWAY, VPN, AND SECURITY FOR IPX AND TCP/IP

You can turn your network into an effective intranet using Novell NetWare and IntranetWare — despite the confusion the leap from IPX to TCP/IP can cause. Learn about the new Novell products with James Gaskin of Gaskin Computer Services.

9 a.m. to 5 p.m.

WINDOWS NT SECURITY: ISSUES AND ANSWERS

Learn to sleep better in this insecure world. Despite the popularity of NT, it has a number of security flaws you should be aware of. This session will go over the various holes, backdoors and other problems the fledgling technology causes.



PICK OF THE DAY

Keynote: The Internet Revolution and the Virtual Enterprise

Wednesday, 9 to 10 a.m.

Edward Kozel, chief technical officer of Cisco, will talk about how to fully develop network services to exploit enterprises such as business-to-business commerce on the 'Net.



Two-day Tutorial

Wednesday, 9 a.m. to 5 p.m.

PRACTICAL NT NETWORKS

No beating around the bush here. This session will give you a condensed and practical guide to Windows NT networks. John Lewis of Lewis and Associates will demonstrate the installation of a NT 4.X Server with complete TCP/IP implementation, as well as Dynamic Host Configuration Protocol, Warehouse Information Network Standards and the Domain Name System, connectivity and administration.

OUR PICKS

Thursday
October 9

10:15 a.m. to 11:45 a.m.

IN PERSPECTIVE: THE MARRIAGE OF DATABASE AND THE WEB

Greg Hemstreet of Everyware Development Corp. leads this session on integrating the Web world with legacy database systems. The session tells you what glue you'll need to bring together HTTP and a variety of database engines.

2 p.m. to 3:30 p.m.

VLAN STATUS AND INTEROPERABILITY REPORT

Don't give up on virtual LANs yet. They help flatten the network and improve performance. Learn what experts have to say about VLAN standardization progress.

9 a.m. to 5 p.m.

NETWORK SUPPORT FOR INTRANETS IN IBM ENVIRONMENTS

Get your hands dirty in this workshop on integrating SNA based

networks with TCP/IP. Led by consultant Anure Gurugé, the sessions covers how to manage SNA/APPN applications running on mainframes and AS/400 machines using TCP/IP technology.

Workshops

9 a.m. to 5 p.m.

STRATEGIC TECHNOLOGIES FOR INTERNET COMMERCE

Can non-Webmasters make a buck on the Internet? 'Net veteran Vince Emery will discuss how to improve your Web efforts. He'll cover sales order processing, receiving payment, attracting visitors and the mechanics of buying and selling advertising.

9 a.m. to 5 p.m.

E-MAIL INTEGRATION IN ENTERPRISE NETWORKS

Is your e-mail system more like the Pony Express than Federal Express? It's time to check out how you can manage your messaging backbone more effectively with Michele Rubenstein of the U.S. Treasury Department. Find out about cost-effective cross enterprise communication.



PICK OF THE DAY

Keynote: Enterprise Management:
From Basics to Business Advantage
and Beyond

Thursday, 9 to 10 a.m.

Frank Moss, CEO of Tivoli, will discuss the history of enterprise management, its future, and the role IT users and the industry will play in shaping that future.

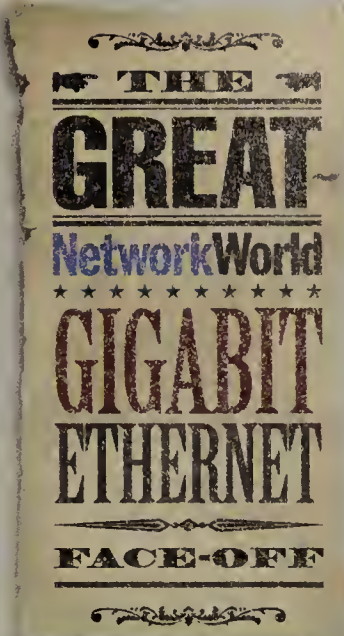


PICK OF THE DAY

Session: The Coming Wave of Internet-Aware Applications

Friday, 10:15 to 11:45 a.m.

Prakash Ambegaonkar of Frontier Technologies will moderate a discussion about the next generation of desktop applications rolling out — from Office 97 to Netscape Communicator. Learn about embedding objects, creating active links and how plain old files will never be the same.



WHEN:

Thursday, Oct. 9, 12 p.m. to 1:15 p.m., Room 202 East, Georgia World Congress Center

Come see a distinguished panel of industry experts and Gigabit Ethernet vendors engage in a presidential-style debate on the future of this emerging high-speed technology. Gigabit Ethernet vendors such as Alteon Networks, Bay Networks, Foundry, Promlnet and 3Com will field questions from the audience and a panel of experts including Kevin Tolly of the Tolly Group, Don Miller of Dataquest and Network World editorial staff. Hear how and where Gigabit Ethernet will fit into your enterprise network.

OUR PICKS

Friday
October 10

10:15 a.m. to 11:45 a.m.

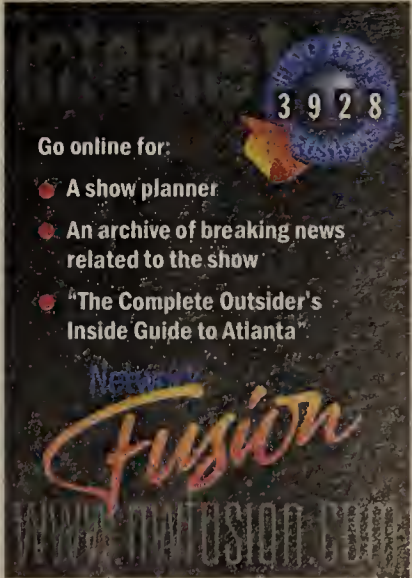
HOW DO YOU LIKE YOUR IP: ROUTED OR SWITCHED?

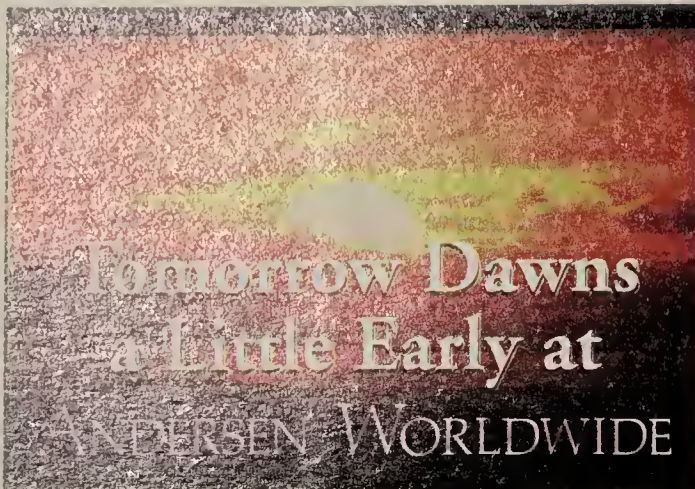
Speakers will discuss IP switching, tag switching, FastIP and good, old-fashioned IP routing.

2 to 3:30 p.m.

IN PERSPECTIVE: EXTRANETS

Looking to keep your customers and business partners talking? Extranet technologies may be the answer. This session promises to explain why extranets are more than a buzz word.





Information Systems Services (ISS), is a division of **Andersen Worldwide**. ISS plans, develops and manages the internal information systems for the two business units, Arthur Andersen and Andersen Consulting. By partnering with them we deliver the most advanced and appropriate computer and communications-based tools, facilities and data. Immediate openings are available for high-quality, motivated personnel to work in a variety of interesting and challenging areas.

All positions are located in **downtown Chicago** and require strong analytical and problem solving skills, excellent written and verbal communication skills and proven ability and interest to learn new technologies. A BS/BA degree or equivalent experience is required.

LOTUS NOTES SUPPORT ANALYST

The ideal candidate will have one year or more of in-depth Lotus Notes System Administration or previous experience as a Lotus Notes Administrator with Windows NT and the ability to assume ownership for the investigation and resolution to server problems. Responsibilities include software/hardware maintenance, upgrades for Notes servers, and planning and recommending preventative maintenance for such.

Minimum requirements: Good organizational skills, quality customer service skills, flexibility to provide on-call support during off business hours, flexibility to work overtime, project management experience and proficiency on Microsoft Suite products. **(REF CODE: 12AT-FNNO)**

SPECIALIST/ANALYST - NETWORK ENGINEERING

This position implements new connections to the network infrastructure; plans/manages capacity and routing infrastructure; provides third-level support for Network Operations; deploys and tests new network technologies into the network infrastructure.

The ideal candidate should possess 3-8 years in this environment along with a Bachelor's degree in a relevant field (e.g. Computer Science, Electrical Engineering, Telecommunications) or equivalent work experience. Experience with LAN/WAN internetworking in an environment using TCP/IP and IPX/SPX protocols, Cisco Router configuration and troubleshooting, Backbone circuit provisioning and troubleshooting, DSU/CSU configuration and troubleshooting, and ling-layer, transport and routing protocols (Frame Relay, TCP/IP, OSPF, etc.). Experience with Network Management tools such as LAN/WAN probes, SunNet Manager, HP OpenView and Cisco Works. **(REF CODE: SPEC/AN NET ENG)**

FIREWALL & INTERNETWORK ADMINISTRATOR

An exciting opportunity exists for a candidate possessing 1-4 years experience on Internet Firewalls, UNIX Systems Administration (SUNOS/Solaris), and the TCP/IP protocol suite. The candidate should also have experience and proven skills in at least three of the following areas: Network management/SNMP including HP OpenView and Sun Net Manager, external Email connectivity and Sendmail configuration, C/C++ Programming and/or advanced UNIX shell scripting, Lotus Notes, Cisco Routers and routing fundamentals (e.g. access lists/filtering of TCP/IP traffic on routers). A Bachelor's degree in Telecommunications, Computer Science or Information Systems is required. **(REF CODE: F&I)**

APPLICATIONS DEPLOYMENT & INTEGRATION ASSOCIATE/ANALYST

The Associate/Analyst position is in the Applications Deployment and Integration (ADI) team within the Application Technology and Support (ATS) group. ATS supports more than 1000 users at Andersen Worldwide. The position involves working with customers, developers and administrators to implement new hardware or software releases as it relates to the LAN and PCs, developing and executing test plans and installing and configuring hardware/software.

The ideal candidate should possess a Bachelor's degree in a relevant field (e.g. Computer Science, Information Systems, or equivalent work experience and outstanding customer service skills. Experience with a majority of the following technologies is preferred: Novell NetWare, Lotus Notes, Microsoft Suite of Products, MS Access/Visual Basic, PC/LAN software and hardware installation and configuration, Windows and Windows networking configuration. **(REF CODE: KMHWS)**

ASSOCIATES FOR SECURITY FIREWALL DESIGN & IMPLEMENTATION

Challenging positions are available in our Security Design & Implementation group. The ideal candidates should have a passion for systems security and possess 2-4 years experience in product evaluation, testing and implementing systems using at least three of the following technologies: Internet access solutions, UNIX, external Email connectivity, Cisco Routers, Remote Access or Novell NetWare. **(REF CODE: SD&I)**

TELECOMMUNICATIONS ANALYSTS

Join the internal telecom department of Andersen Worldwide and provide your voice mail, PBX, voice network and overall telephony expertise to over 360 Arthur Andersen and Andersen Consulting offices worldwide.

The ideal candidate will have 2-4 years telecommunications experience with emphasis in PBX and voice mail systems and a Bachelor's degree in Telecommunications or related field. **(REF CODE: PBX)**

SYSTEMS ADMINISTRATOR - WINDOWS NT

Join a team with responsibility for the technical support of NetWare, Lotus Notes, MS/SYBASE SQL Servers as well as specialized Gateways Installed on a production LAN Segment. Major duties include: Ongoing monitoring, performance management and capacity management of software/hardware installed on the LAN segment, implementation and maintenance of automated monitoring/alert mechanisms as necessary, design and implementation of backup and recovery strategies.

Minimum requirements: 2 years of LAN administration experience with recent hands-on experience as a MS Windows NT system administrator in LAN/WAN networking environment. Knowledge of SQL, SYBASE and/or Microsoft SQL Server would be helpful. Knowledge of backup and recovery concepts and software a plus. **(REF CODE: NT)**

To learn more about ISS and our other open positions, please visit our web site at: <http://www.awo.com>

We offer a competitive salary, comprehensive benefit package and opportunity for growth. Please email, mail or fax resume, cover letter and salary history to: **Andersen Worldwide, Information Systems Services Division, Attn: ISS Recruiting, 225 North Michigan Avenue, Chicago, Illinois 60601-7600. Email: iss-web-recruiting@awo.com Fax: 312-507-2548. IMPORTANT: REFERENCE CODE FROM ABOVE AND SALARY HISTORY MUST BE INCLUDED ON COVER LETTER. Equal Opportunity Employer M/F/D/V.**



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10/20	Review: Network Monitoring Products; IP Multicasting; Harvey Study	October 8th
10/27	Bonus Distribution at Networks Expo, Dallas; LAN Special Focus: Intel in the LAN	October 15th

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Senior UNIX Systems Administrator

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Global Network Security Engineer

You'll oversee and engineer our global network and internet security, ranging from firewall configuration and installation to protocol analysis and troubleshooting. You'll also address routing and route propagation issues/policies/procedures, as well as provide packet filtering and end-user assistance. The qualified candidate will possess a BSCS or equivalent plus an in-depth knowledge of Firewall 1, TCP/IP, packet filtering, route propagation, Solaris/UNIX, DNS and overall protocol routing. Additional experience with Sniffers, 3Com equipment and HTML desired. Job Code: KD/GNSE/NW/9/22/97

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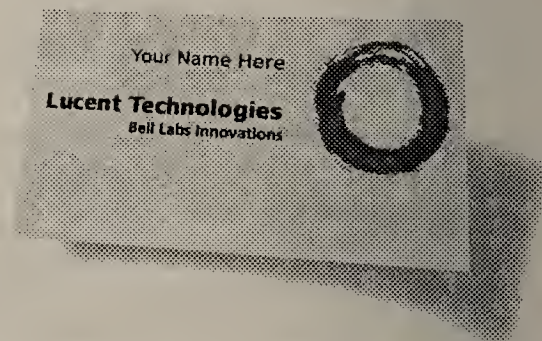
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Or visit our booth at Network+ Interop—Recruitment Pavillion, Oct 8, 9, & 10, Georgia World Congress Center, Room #170 & 171 West, Atlanta, GA

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- Embedded Software Engineer
- Telephony Team Leader
- Sr. Software QA Engineer
- Test Automation Engineer
- Systems Software Engineer

Sales/Service/Marketing

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- Account Managers
- Marketing Publications Specialist
- Systems Engineers (Multiple Openings)
- International Account Executive
- Sr. Product Marketing Manager

Operations

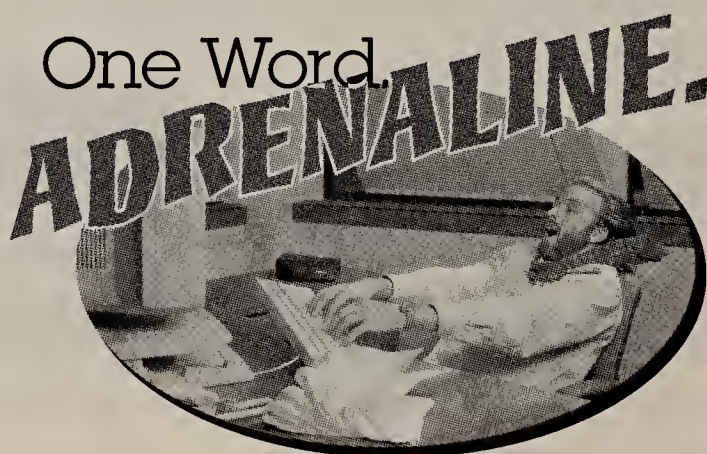
- Sr. Manufacturing/Product Engineer

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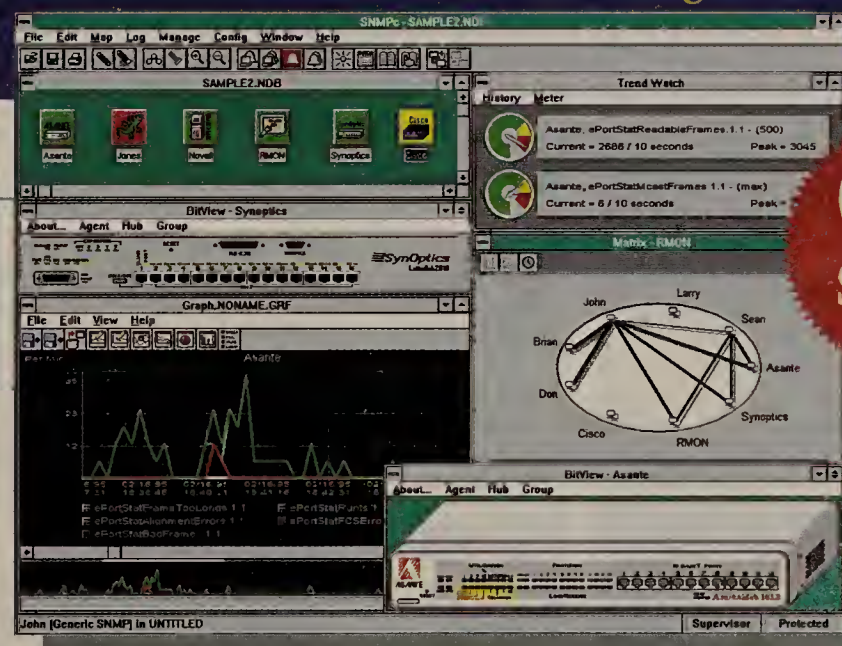


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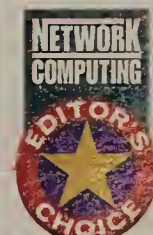
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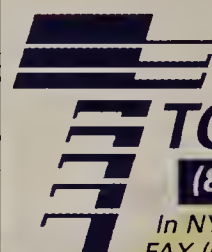
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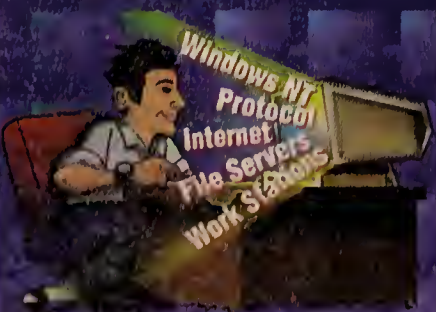


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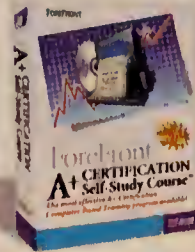
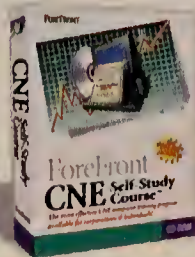
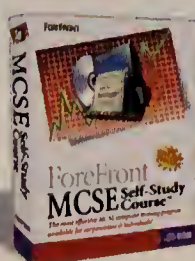


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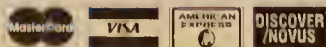
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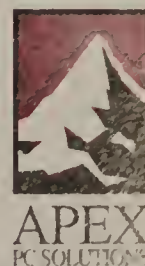
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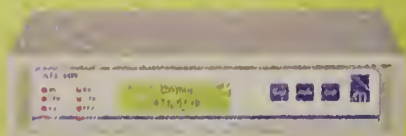
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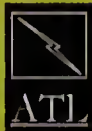
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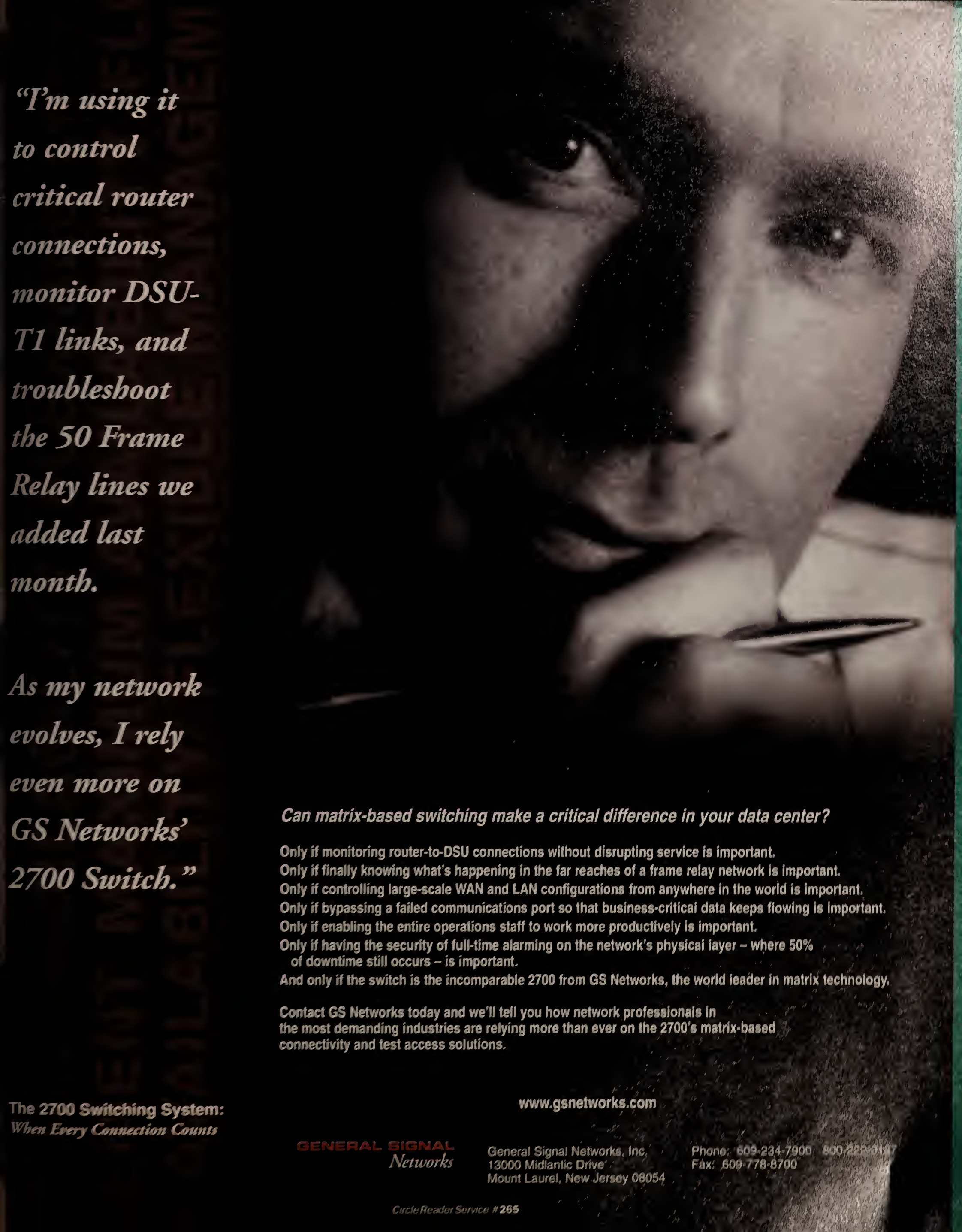
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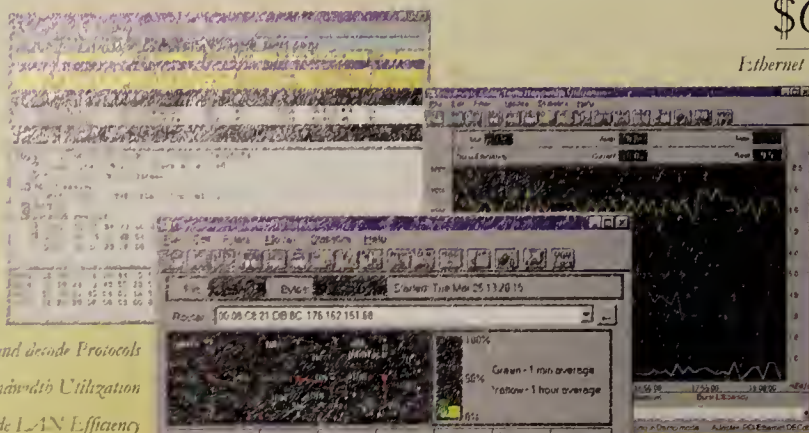
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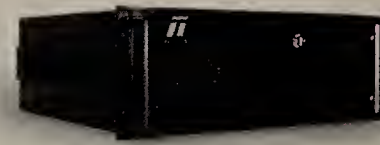
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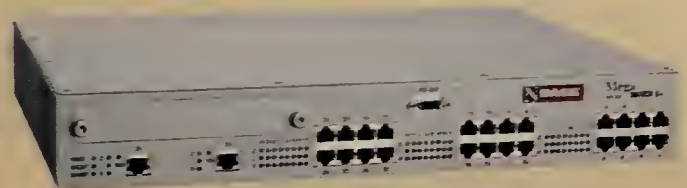
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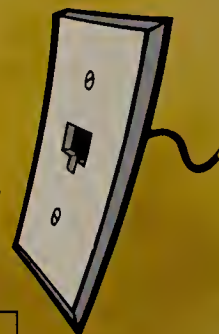
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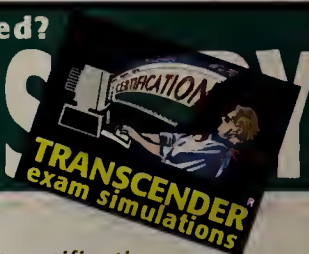
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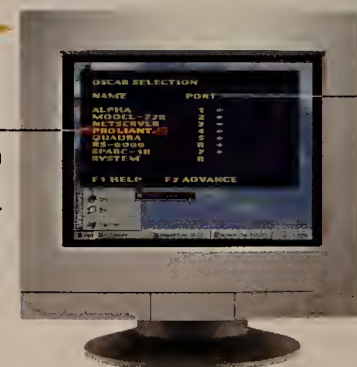
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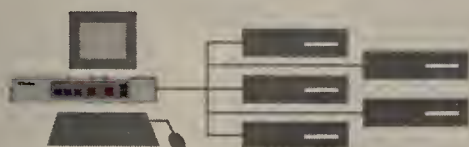
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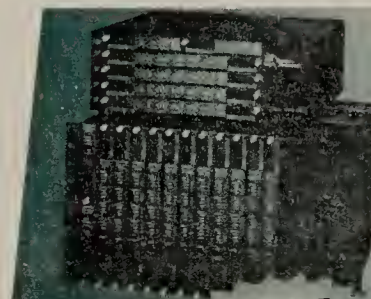
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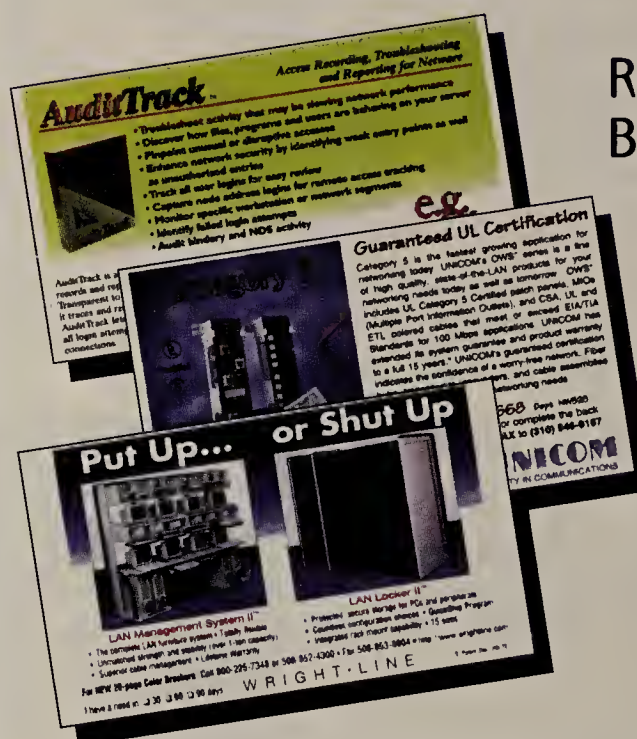
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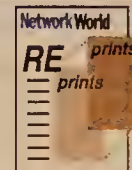
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IBM muscling into midrange server space

Netfinity 7000 servers to be powered by 200-MHz Pentium Processors and run Windows NT.

By Marc Songini

IBM is pushing further into Compaq Computer Corp. territory with a new line of Windows NT-based Pentium Pro servers.

Sources said that while the technology is comparable to what already is in the market, IBM believes its services and software, and the device's overall manageability, will give it an edge.

The Netfinity 7000 server series, expected to be announced today, will support up to four processors. Later iterations will scale to eight processors. The line covers the middle to high end of the PC server market, putting it in direct competition with Compaq's ProLiant 7000 series.

The systems can be remotely managed and diagnosed via a Web browser, the sources added.

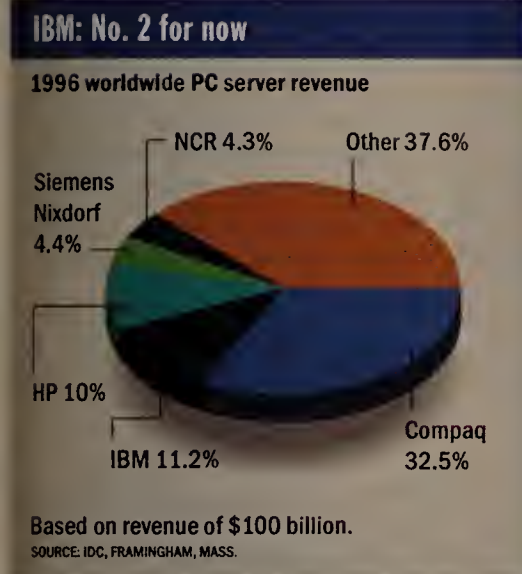
IBM also will be delivering extensive

services and start-up support — the sort generally consistent with an enterprise-class product.

Analyst Sam Albert of Sam Albert Asso-

ciates, a consultancy based in Scarsdale, N.Y., said, "This says IBM is not going to be asleep at the switch and not be insular but recognize what customers want and supply it. It's part of Louis Gerstner's reality check."

The cost of the first Netfinity server will be about \$15,000 and should start shipping in October. ■



Andy Grove, CEO of Intel Corp. was scheduled to appear at the press conference via satellite to show his support.

IBM declined to comment on the product announcement.

Sources said one of the boxes will feature up to four 200-MHz Pentium Pro processors with 4G bytes of error checking and correcting memory, 1M byte of Level 2 cache memory and up to 54G bytes of internal storage. The drives are hot-swappable to reduce downtime. They also can handle up to 1.7 terabytes of external storage.

A key attribute is software. The server line will have the LAN Client Control Manager, the same system installed in IBM client-based systems. The line also is expected to have a variety of software packages available with it, such as NetFinity Manager management software, ServerGuide and Lotus Domino. NetFinity monitors and manages all aspects of server activity, from disk space to communications ports. ServerGuide is server configuration software.

The servers also integrate with management software from Tivoli Systems, Inc., Intel and Microsoft Corp., sources said.

The boxes include a special management card that monitors the system and automatically reboots when user-defined thresholds are exceeded, sources said.



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Lucent

Continued from page 1

announced a strategy to attack the enterprise network market. The difference is this time Lucent is building its own products and placing them in categories recognizable to network IS buyers. "This is what everybody's been waiting for Lucent to say for a year," said Peter Bernstein, president of Infonautics Consulting, Inc., a research firm in Ramsey, N.J.

Previously, Lucent principally resold routers, switches and hubs from Bay Networks, Inc. When it has offered customer premises data products, they have tended to be specialized gear such as the Multimedia Communications Exchange server, which sits between a PBX and an Ethernet switch to provide telephony call control instructions to a real-time data-conferencing or video-conferencing session.

One way Lucent is trying to differentiate its new MX 1000 is by supporting the connection admission control (CAC) algorithm developed by Lucent's Bell Laboratories unit. Lucent claims CAC can boost the effective

throughput of voice and data traffic over variable bit rate circuits and other ATM service classes.

The goal is to provide traffic-engineering efficiencies that save carriers and users money when they are using a unified voice and data network infrastructure, said Susan Barbier, Lucent's market development director for data networking.

Also employing the CAC algorithm is the campus backbone switch, the AX 500. Bell Labs designed the AX 500 to support virtual LANs with the help of engineers from Agile Networks,

Inc., a VLAN company purchased by Lucent last year.

Analysts and competitors said Lucent still has a long road ahead of it. Officials with Lucent rival Northern Telecom, Inc. — which runs neck-and-neck with Lucent in its primary markets of PBXs and central office telephone switches — said the new MX 1000 offers many of the same multiservice characteristics of Nortel Magellan ATM and frame relay switches. Nortel claims to have sold 6,000 Magellan switches to users and carriers since 1994.

"They have a long way to go to

catch up," said Mark Tharby, group marketing manager for Nortel Magellan.

And the initial market still may be limited. Lucent's switches are likely to be of most interest to network managers looking to integrate voice and video applications on their LANs and wide-area data networks, rather than simply buying more raw bandwidth for the campus, said Tom Nolle, president of CIMI Corp., a Voorhees, N.J. technology assessment firm.

But Nortel already has sewn up key commercial accounts such as Sprint Corp., which

recently installed 38 Magellan Passports (NW, Aug. 4, page 6). Tharby suggested that Lucent may be aiming to dislodge Cisco Systems, Inc.'s StrataCom broadband switches as the frame relay backbone of Lucent's old parent, AT&T. Already the dominant supplier of AT&T's central office telephony switches, O'Shea said, "we certainly would like to be a major [data-switching] supplier to AT&T."

Lucent officials acknowledge the ATM interface card for the Definity PBX is not expected to be widely adopted by Lucent's huge PBX installed base. Its main purpose would be to hand off voice traffic in native ATM cell format to campus backbone and WAN ATM switches such as Lucent's own new boxes.

Barbier said the Definity ATM also could be used by large call centers that use the Definity as an automatic call distributor for hundreds or thousands of agents, while simultaneously pulling in customer data to populate the agents' screens via computer-telephone integration. ■

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THE LUCENT LINEUP

Product	Description	Notable feature	Price	Availability
AC 60	4-slot multiservice access concentrator	600M bit/sec ATM switching fabric	\$18,000-\$35,000	Q4
AC 120	12- or 16-port multiservice access concentrator	1.2G bit/sec ATM switching fabric	\$35,000-\$150,000	Q4
AX 500	ATM campus or MAN backbone switch	Supports autodiscovery of linked AX 500 nodes	\$25,000-\$65,000	Q1 '98
Definity ATM Networking	ATM line card and software upgrade for Definity PBX	Interfaces with ATM LANs and MANs to ship voice traffic	\$42,500	Q1 '98
MX 1000	ATM enterprise WAN or carrier edge switch	Supports multiple service classes with usage-based billing	\$54,000-\$320,000	Q1 '98

Cisco

Continued from page 1

The AS5300 is intended for large enterprises, telecommunications carriers and other service providers that require consistent high-density connectivity.

The new remote access server will compete against 3Com Corp.'s U.S. Robotics Total Control Hub and Ascend Communications Inc.'s MAX 4004, which sports four T-1 or ISDN Primary Rate Interface trunks and up to 96 dial-up connections.

3Com's U.S. Robotics and Ascend are the two leading vendors of dial-up remote access concentrators, with 36.7% and

34.8% market share, respectively, of the \$1.2 billion market in 1996, according to The Del'Oro Group in Portola Valley, Calif. Cisco is a distant third, with 9.5%.

Analysts had been expecting the AS5300 for a while because Ascend's MAX 4004 has been shipping for more than a year (NW, May 20, 1996, page 12).

"This is not really a surprise," said Brad Baldwin of International Data Corp., a market research firm in Framingham, Mass. "I'm sure that's a sigh of relief for [Cisco] because it has been a long time coming. We see this box being important to most of the ISPs except the large national and regional ISPs. In

terms of the corporate IT clients, this is also a good size for very large sites."

The Cisco AS5300 supports as many as 120 concurrent analog modem calls and ISDN Basic Rate Interface channels, four T-1/E-1/ISDN PRI trunks and dual Ethernet LAN attachment—one a straight 10M bit/sec connection, the other a 10M/100M autosensing port. That is twice the density of Cisco's current high-end dial access server, the AS5200.

The AS5300 incorporates a 150-MHz Reduced Instruction Set Computing (RISC) based CPU and secondary memory cache that enables it to sustain 120 concurrent sessions at or near line speed, Cisco claims.

"It's fast," said AS5300 user Bradley Rhoades, principal engineer of US WEST, Inc.'s Enterprise Networking Services. "I wish the AS5200 started here, but it didn't. We are rolling out a very large consumer dial access service, and we've been pushing Cisco for some new features," Rhoades said.

Rhoades questioned the need for a 100M bit/sec backhaul port

on the AS5300, though.

"If you do the math, if I've got four PRIs and a 100Base-T port, why do I need 100Base-T coming out of that box?" he asked. High-density serial connections might make more sense, he said.

Other features of the AS5300 include support for Cisco IOS software capabilities such as data encryption, Multilink PPP and

Web browsing, the company said.

The AS5300 also is the first Cisco access product to incorporate the high-density Modem ISDN Channel Aggregation (MICA) technology from Telebit Corp. Cisco acquired Telebit's MICA operations more than a year ago (NW, July 29, page 11).

MICA digital signal processors enable the simultaneous support of remote access users through analog modems and ISDN devices, Cisco said. The benefit of this is higher dial densities, product flexibility and investment protection, the company said.

Alternately, the AS5300 supports up to 48 of the Microcom, Inc. modems currently shipping in the AS5200, providing an upgrade path for existing customers. Users also can increase bandwidth by aggregating ISDN calls across AS5300s and AS5200s through Cisco's Multichassis Multilink PPP software.

The Cisco AS5300 will ship in November. It costs \$44,960. The AS5200 now costs \$21,300, down from \$37,500.

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5300 reasons

Features of Cisco's new AS5300 remote access server:

- 150-MHz RISC CPU
- Four PRI, T-1 and E-1 interfaces
- 96/120 modem connections
- Dual LAN (10M bit/sec, 10M/100M bit/sec) backhaul
- MICA digital signal processors
- Support for Web graphics and other multimedia applications

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USPS 735-730

DataLinks

Continued from page 1

file systems. The software also can be used for non-Web applications.

DataLinks will be part of the next major release of IBM's DB2 Universal Database, which is expected sometime in 1998. IBM has not announced a date for that release.

When released next year, DataLinks will be a major addition to the IBM Digital Library, a bundle of client/server software and services for collecting, organizing and distributing multimedia information. Digital Library, which relies on DB2 or an Oracle Corp. relational database, has been successful in specialized markets such as museums, libraries and film production studios. DataLinks is essential to extending Digital Library into corporate accounts.

"DataLinks lets you apply database controls on files outside the database that exist in operating system file directories," said Lorin Kalisky, editor of "ContentWatch." ContentWatch is a monthly report published by The Content Group, a San Francisco consulting company specializing in multimedia management systems.

"DataLinks lets you apply database controls on files outside the database that exist in operating system file directories," said Lorin Kalisky, editor of "ContentWatch."

Traditionally, relational databases use a cumbersome technique, Binary Large Objects (BLOB), to incorporate an image, for example, in an application. The database uses pointers that identify where the BLOB files can be found.

One problem with BLOBs is that the image's properties, such as color and shape, simply disappear inside the BLOB, said Thomas Aguiere-Smith, Content Group's vice president of technology. The database has no real understanding of what is in the BLOB and as a result, cannot search for this information.

A related problem is the lack of referential integrity, Aguiere-Smith said. If the BLOB file changes or is deleted, the database would have no knowledge of either action, and information becomes out-of-date or inaccurate.

New generations of object-relational databases, including the DB2 Universal Database, can do this with recent technology, but only if the image is physically stored in the database.

How it works

DataLinks has three components.

The first component, Extender, plugs into the DB2 Universal Database so an administrator can create tables that define links to files stored on a networked

Unix or NT server.

The second component, File Manager, runs on the database server and executes the links as database transactions. It also tracks different versions of the files.

The third component, File System Filter, runs on the Unix or NT servers that store the files. It works with File Manager to ensure a database application user is

allowed access to a given file. The filter also notifies the File Manager of any changes made to the file.

IBM designed the filter so it would not slow the application's writing or reading of the files, said Aguiere-Smith. "Once the filter authorizes file access, the application then interacts directly with the file system," he said.

According to Content Group, IBM plans to make DataLinks available on all DB2 platforms, starting with AIX, IIP-UX, Solaris, NT and OS/2. Later, it will be available on OS/400 and OS/390 for mid-range and mainframe computers. ■

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Swine time online: Have you seen the little virtual piggies?

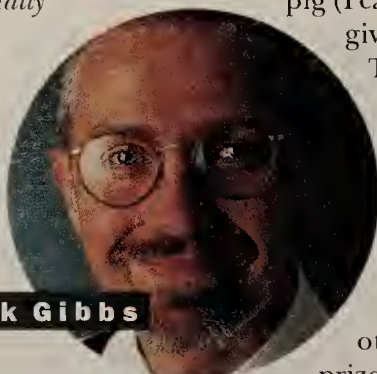
Sing to the tune of "Piggies" from The Beatles' *White Album*.

*Have you seen the Tamagotchi
Crawling in the bits
And for all the Tamagotchi
Life is getting rich
Always have clean bits to virtually
grow in.*

Tamagotchi. In Japanese I think it means something like "expensive piece of electronic crap to waste lotsa time with" (I'm translating loosely). Actually, it means "lovable egg," but the expensive part is right: Yours for only \$29.95 each.

If you haven't seen one of these things, they are flat egg-shaped gizmos that are about 3 or 4 inches long. Lovable? Hmm. Tamas (as the Tamagotchi cognoscente would call them) contain some pretty basic electronics that display a cartoon-like creature on a tiny LCD screen.

You have to feed and care for the virtual pet by pressing buttons (hourly!) and, depending on the type and quality of care you provide, it grows or dies. If the pet grows, the way you "raised" it determines what attributes it will have, such as naughty,



Mark Gibbs

found their JavaScript site of the day was SwineOnline (<http://swineonline.tvvisions.com/scripts/index.asp>) — another virtual pet, but online. Of course, I had to check it out.

At SwineOnline, you name your virtual pig (I called mine Swineburne), and give them your e-mail address.

They give you virtual \$400 and you use the v-money to buy food, veterinary care, toys and all the other things that virtual pigs like and need. If you get all the parameters right you get points, and if you get more points than the other "farmers" you can win prizes.

*In their scripts with all their backing
They don't care what goes on around
In their code there's something lacking
What they need's a good hacking.*

Of course, I immediately hit a bug and couldn't buy my pig vitamins. And, of course, the guys at SwineOnline couldn't reproduce the bug. By the time I heard back from them (only about an hour), I was busy with other things (like earning a living), so I didn't bother visiting Swineburne again.

Then the messages started arriving: "Farmer MG: I feel like I could eat a horse.

If you don't visit me pretty soon, I just might. Signed, Swineburne."

Well, I had no time. Then, after three more messages like the first, came this: "Farmer MG: You want to win this game? Let me give you some help. Do the following: Bring me to the vet. Feed me. Buy me some new toys. I know you can beat

those other farmers. Signed, Swineburne."

To hell with it, I thought. Then: "Farmer MG: A pig's life is a hard one. A pig never knows when he is about to be sold to the butcher or mutilated by aliens. My life ended peacefully, in my pen. I hope to see you on the other side. Just remember, I did it my way. Signed, Swineburne. P.S. You can visit my grave by going to..."

Great. Just what I needed, virtual guilt. Is this progress?

*Everywhere there's lots of creatures
Living virtual lives
You can see them out a'searching
Through their hard disk drives
Trying to get girls and guys to save their
bacon.*

*Have you tried makin' bacon? Oink at
nwcolumn@gibbs.com or squeal your message at
(800) 622-1108, Ext. 504.*

*People get very attached to the
virtual pets and experience lots
of misplaced emotions.*

nice and so on ... all cute stuff (ugh).

What's so interesting about this fad is that the Tamagotchi is so lame. It's not like it has really complex behavior. But check out the Tamagotchi links at <http://search.yahoo.com/bin/search?p=tamagotchi> to see how obsessed people get. There's even a Tamagotchi Adoption Agency, for God's sake!

People get very attached to the virtual pets and experience guilt when they aren't good parents, loss when the things "die" and lots of other misplaced emotions.

*Have you seen the virtual piggies
In their starched Web sites
You will find the virtual piggies
Staying up all night
Always have clean sites to play around in.*

It was with some surprise that when checking out one of the Web's coolest sites for JavaScript (www.webcoder.com/) I

AT LEAST HE DIDN'T WRITE A COUNTRY MUSIC SONG While this year's Internet initial public offering (IPO) market has been sluggish at best, recent venture capital survey results from **Price Waterhouse** and **Coopers & Lybrand** show that, overall, investing in the Internet is more popular than ever.

Unfortunately, this usually means little to the small investor, who typically is frozen out of the action until a company premieres on Wall Street, by which time all the real money has been made and members of the investing public are left to fight over cyberchump change.

In the past year, however, several online options have arisen that not only allow small investors to get an early piece of the action, but also give start-ups in need of cash a whole new avenue of funding.

The latest service is offered by **Wit Capital**, which last week debuted online investment banking on its Web site (www.witcapital.com). Founder **Andrew Klein** says Wit Capital "is trying to level the playing field for small investors."

Starting next month, the company will offer several options for investors. Initially, people can sign up online to invest in IPOs underwritten by investment banks. The first IPOs should be available by next month, along with online stock brokerage services and venture capital opportunities, Klein says.

Sometime next year, he says, Wit Capital will launch the **Digital Stock Market**, which will allow investors to trade directly with other investors, without incurring those cursed brokers' fees.

Klein found his inspiration for Wit Capital in a few glasses of beer. A former securities lawyer, in 1993 he started the microbrewery **Spring Street Brewing Co.**

Spring Street last year became the first company to complete a public offering over the Internet. Wit Capital grew out of the creation of a Web-based trading mechanism that allows investors to trade shares of the microbrewery without a middleman watering down the deal.

WHERE EVERYONE'S AN INSIDER Continuing its campaign to ensure that no network's bandwidth go unused, push technology mindshare leader **PointCast, Inc.** has announced 10 new editions of its **PointCast Business Network**.

In making the announcement, PointCast Chairman **Chris Hassett** said, "The proliferation of unfiltered information has created 'data smog.'"

Of course, critics of push technology argue that shoving crudely categorized information into corporate networks creates its own kind of pollution. And PointCast has come under particular fire this year as a bandwidth hog.

PointCast is calling its new, free offerings the "**Industry Insider**" editions. Two of these, the **Government Insider** and the **Healthcare Insider**, are available for download now at www.pointcast.com.

The Cupertino, Calif.-based company plans to release Industry Insiders by year-end for workers in the industries of banking, consumer markets, law, real estate, "state & local" and telecommunications, with aerospace and automotive editions following soon after.

Some insiders. These categories cover just about everybody we know.

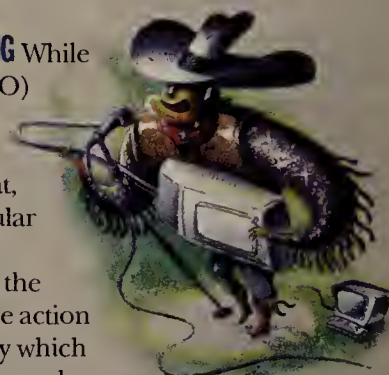
Meanwhile, our own "insiders" say PointCast is not yet close to naming a CEO as Hassett's successor. The company in June announced it wanted to replace cofounder Hassett with an industry veteran, which fueled IPO talk.

COMING BACK FOR MORE Sun Microsystems has submitted its response to the **International Standards Organization (ISO)** panel. In July, the ISO rejected Sun's bid to shorten the application process for making its Java programming language an international standard.

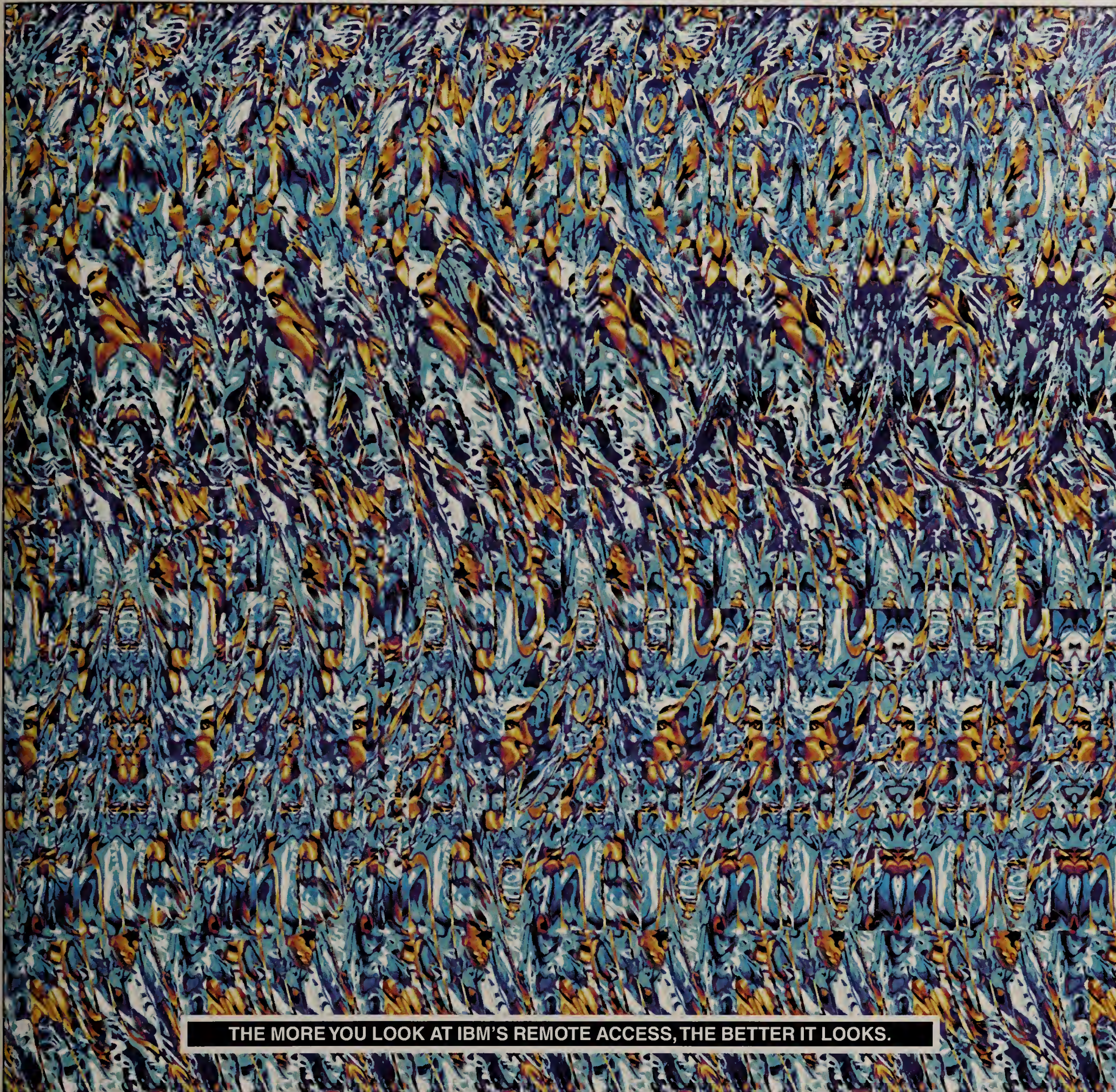
The committee can take up to 45 days to consider Sun's revised application before voting.

One group expected to support Sun's bid to standardize Java is the **Java Developer's Lobby**, which has grown to more than 1,000 members in the five weeks since its founding (NW, Aug. 18, page 1).

Insert stupid joke here, and then pathetically beg readers for crumbs of news about Internet and intranet start-ups, blah blah blah. Contact Chris Nerney at (508) 820-7451 or cnerney@nw.com. That's how the tag line would read, Mr. 'Net Bore, if only we copy editors had the guts to slip this into your dopey column.



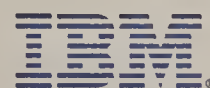
Hold the image RIGHT UP TO YOUR NOSE, then SLOWLY move the image away from your face until the TWO SQUARES above the image TURN INTO THREE. When you have THREE SQUARES, hold the image still and a 3D illusion will slowly emerge. If you can't see the "30% off," don't worry. You can still get in on the remote access savings by calling the phone number below. ©1997 Magic Eye Inc.



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